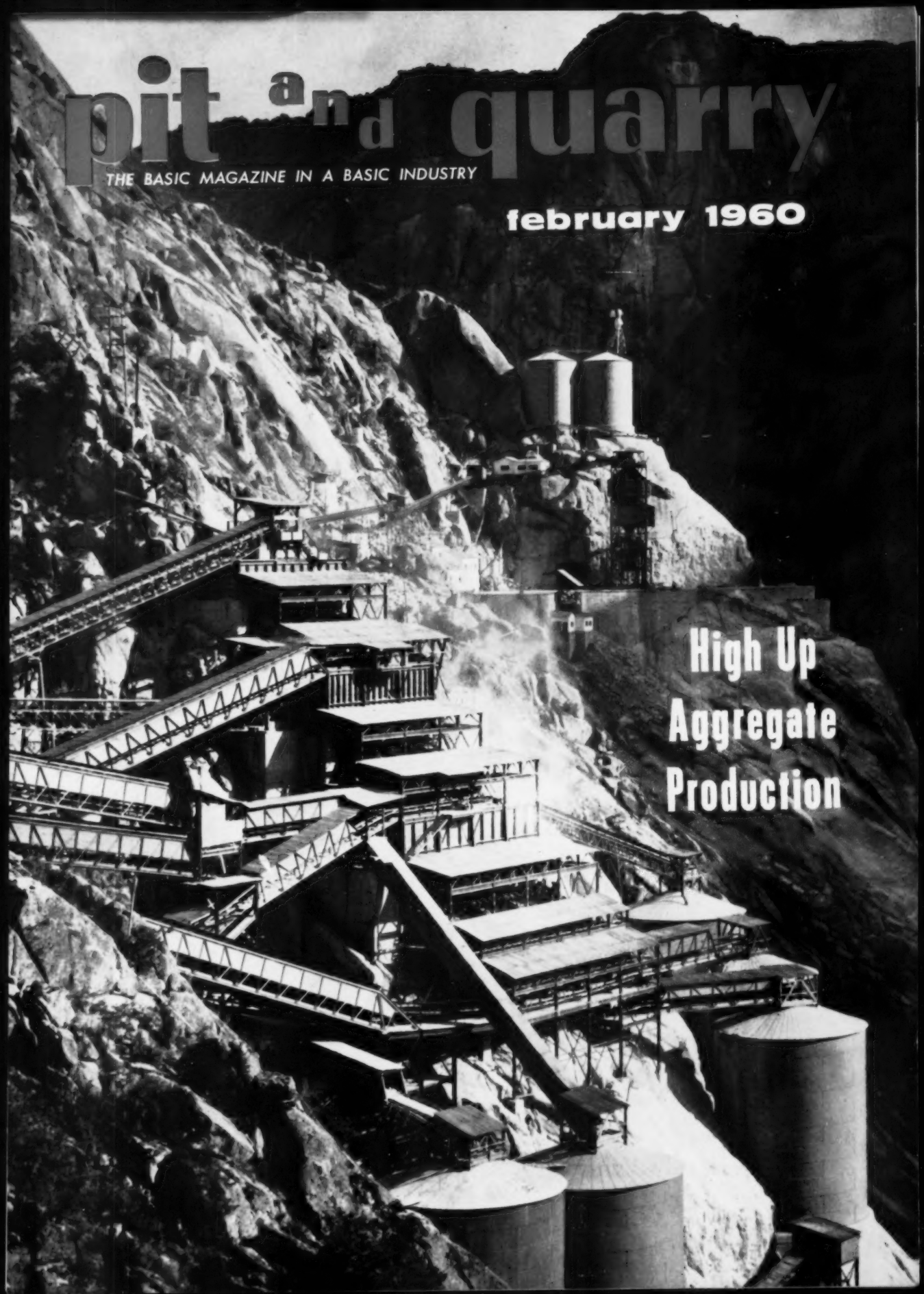
pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

february 1960



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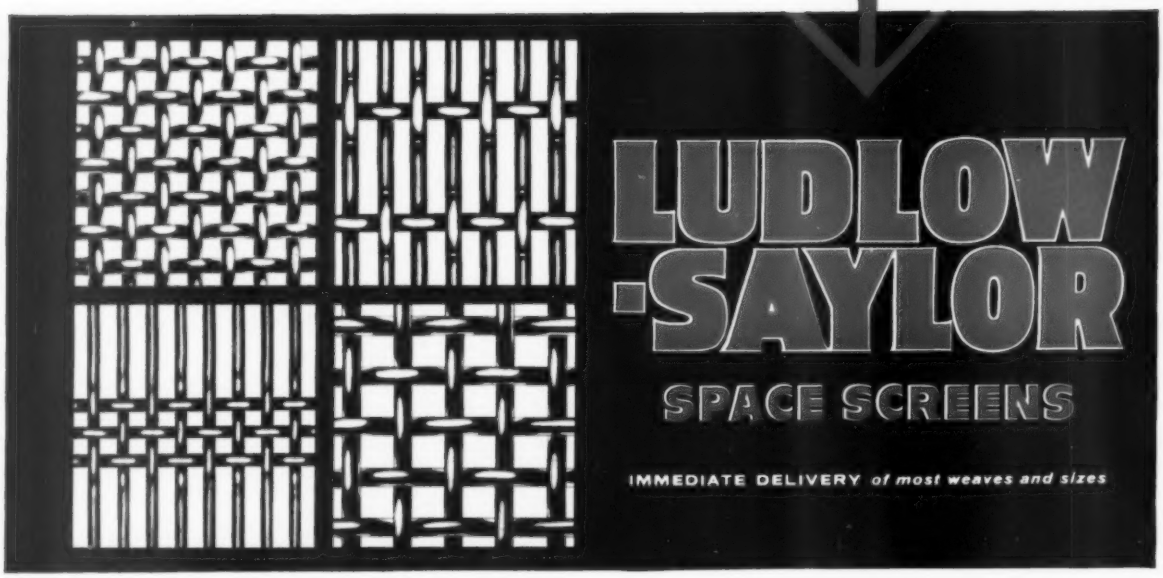

Ludlow-Saylor Screens and Wire Cloth can be furnished in any steel including SUPERLOY high carbon, LUDLOY oil-tempered, stainless or other alloys; Monel, bronze, copper, brass or any metal that can be drawn into wire.

Tougher wire with controlled ductility—tighter, rigid weaving—finish leveling to eliminate buckling and bulges—shearing, not burning, wire edges to make them absolutely square—precision applied hook strips for easier installation and higher tension . . .

These are the reasons L-S Screens last up to twice as long, give more efficient one-pass separation, increase output, improve product uniformity and quality.

Order, insist on L-S Screens. *Write for Condensed Screen Reference Catalog.*

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CHICAGO 6261 West Grand Ave.
PITTSBURGH Union Trust Bldg.
HOUSTON 5638 Harvey Wilson Dr.

FOUNDED 1856

Enter Cover 2 on card, page 169

SHORTENS TRUCK HAUL 50% with LINK-BELT belt conveyor

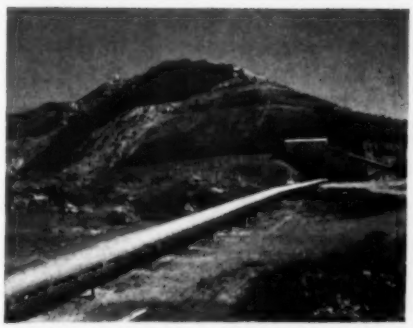
BELT CONVEYOR at Inkom plant of Idaho Portland Cement Company passes under road on way to mill storage bins.

Idaho Portland Cement Co. also trims costs with heavy-duty CA vibrating screen

Until lately, trucks shuttled the entire distance between quarry and crushing and screening plant at Portland Cement Co.'s Inkom (Idaho) mill. Now half the trip—825 ft.—is spanned by a Link-Belt overland belt conveyor connecting a new crushing and screening plant with storage facilities at the mill. Carrying minus ¾-in. limestone at 150 tph, it enables trucks to make more quarry-to-crusher trips per shift . . . has paid off in healthy savings.

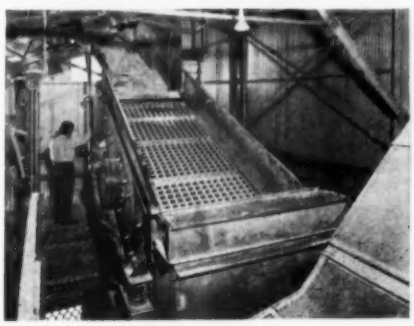
At the screening station, Link-Belt CA vibrating screens feed a now-smaller-sized limestone to ball mills, increasing their capacity and reducing maintenance. Sizing conforms to the exact needs of the main plant, with no further crushing or screening needed.

There may well be opportunity for comparable savings at your plant. Investigate—call your nearest Link-Belt office. 15,210



LIMESTONE SOURCE is hill which forms background for 825-ft. belt conveyor and crushing and screening building.

VIBRATING SCREEN, heavy-duty, double-deck type, sizes crushed limestone to minus ¾ inch. Oversize is chuted to hammermill.



LINK-BELT

CONVEYING AND PREPARATION MACHINERY

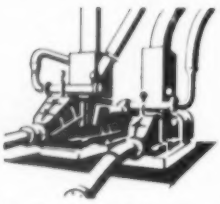
LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

Enter 1 on card, page 169

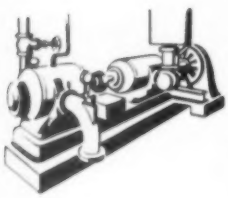
PIT AND QUARRY, February, 1960, Vol. 52, No. 8. Published monthly by Pit and Quarry Publications, Inc., 431 South Dearborn St., Chicago 5, Ill. Subscription price $3 for 1 year in the U.S., possessions and Canada. Central and South America $10 for 1 year, elsewhere $15. Single Copy $.50 except $1 for January, May and July. Entered as second class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879. *Postmaster: Please send notices on Form 3578 and copies returned under label Form 3579 to 431 South Dearborn Street, Chicago 5, Ill.*

FULLER EQUIPMENT

for the process industries

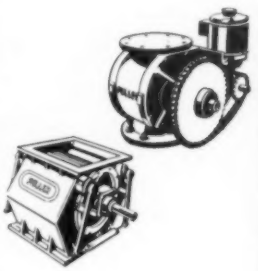


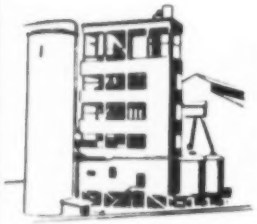
Pneumatic Materials Handling Systems. Widely specified throughout the process industries, Fuller's range of equipment offers best single source for solving problems in moving dry bulk materials pneumatically. Fuller-Kinyon Pumping Systems, Airveyor® Pressure and Vacuum Conveying Systems, and F-H Airslide® Fluidizing Conveyors are completely sealed to prevent both contamination of the product and any leakage of dust, etc., into the surrounding area. They are used to move dry, granular and pulverized materials to and from cars, ships, trailers, storage and processing points.



Fuller Rotary Compressors and Vacuum Pumps are vibration-free, can be installed anywhere, even on balconies. Fewer moving parts mean minimum maintenance. Compressors and Vacuum Pumps handle air and gases from 30 to 3300 cfm at pressures to 125 lb. gage. Vacuums to 29.95 in. (referred to 30-in. barometer).

Fuller Vane-type and Roll Feeders . . . for volumetrically controlled feeding of a wide range of dry pulverized or granular materials. Also Fuller Rotary Valves . . . used under silo deck slabs and bins to permit the free flow of pulverized materials which tend to arch, such as lime and cement raw materials.





Fuller Preheaters, Humboldt Suspension Type . . . for preheating dry, pulverized Portland cement raw materials with rotary kiln waste gases.

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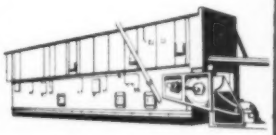

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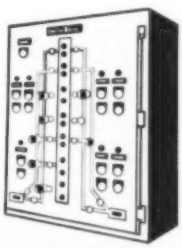

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PIT and QUARRY

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Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel, Slag and other nonmetallic minerals. Copyright 1960 by Pit and Quarry Publications, Inc., 431 S. Dearborn Street, Chicago 5, Illinois. PIT AND QUARRY magazine was founded by H. W. Baumgartner, October, 1916.

To subscribers: When requesting change of address, kindly send old as well as new address.

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✓ *Indicates a* PIT AND QUARRY *staff-written report*

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in cement . . .

Sturtevant Air Separators make possible highly efficient closed-circuit systems. Large circulating loads increase output, eliminate overgrinding. Ball and lining life lengthens, power costs are lowered. Top quality cement results from precise control of finenesses. Standard 16 ft. Sturtevants deliver raw fines up to 70 tph, finished fines up to 260 bph.

in aggregates . . .

Sturtevant Air Separators classify sand without water, clean sand by de-dusting it. Pre-classification by air can also increase screening production by removing screen-blinding fines. In blending operations, Sturtevants select desired fines from grinder throughput. This graded product is then used to overcome fineness modulus deficiencies.

Send for Air Separator Bulletin No. 087.

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pit and quarry

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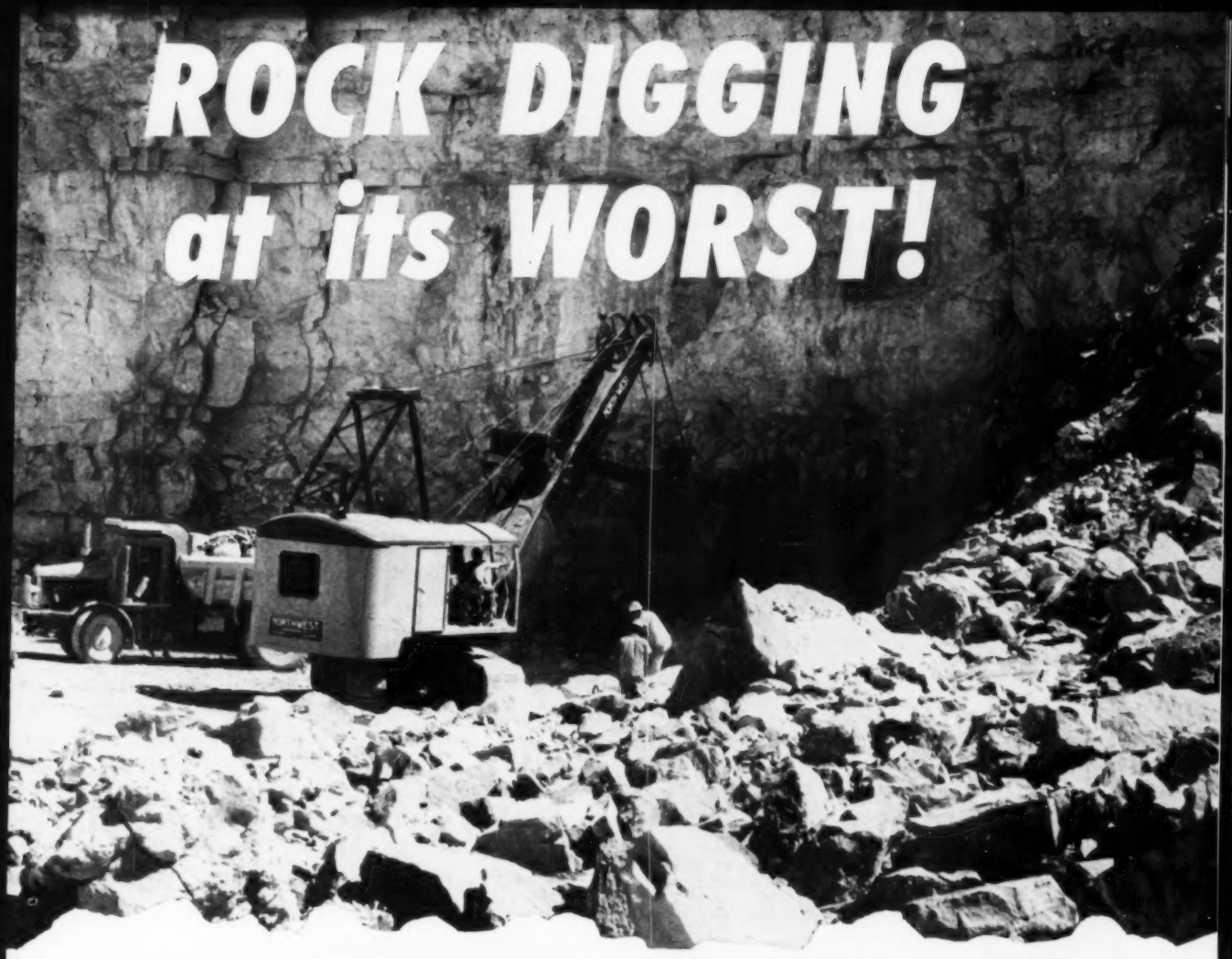
ROCK DIGGING at its WORST!



Certainly no one is more familiar with the problems of handling rock than the cement producer. This big 80-D Northwest is in the pits of the Marquette Cement Co., at Cowen, Tenn., loading out limestone from 100-ft. face.

Marquette Cement is a long-time user of Northwest Shovels. This is the 11th Northwest that Marquette has bought. Here is another repeat order by a company that knows its business—a repeat order that testifies to the high quality of Northwest Performance.

The Northwest 80-D is outstanding as a rock shovel. The Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste. It's a clean cut through the bank without delays or restarts. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and make spotting smooth and easy, reducing spillage. The Feather-Touch Clutch Control takes the heavy work out of throwing drum clutches without resorting to compressors, pumps, valves or other delicate mechanisms. Northwest Steering reduces the delays of relocation. These are just a few of the advantages that have put so many Northwests in gravel pits and quarries all over the Country. They help to assure maximum crusher production!

Why not find out why so many contractors and gravel producers in the Country have bought Northwests again and again? Let us give you the full story.

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HAULS OF

HERE are on-the-job stories of three United States Rubber Conveyor Belts, taken from "U.S." belt records in the rock products industry.

These belts are just some of the "U.S." standouts which demonstrate, year after year, why "U.S." is the world's largest producer of conveyor belts.

For steady, day-in-and-day-out dependability in conveyor belting, it always pays you to secure the advantages of "U.S." Engineering. "U.S." Engineers work directly with "U.S." Distributors or original equipment manufacturers to assure their obtaining the right belt recommendations for each type of conveying.

The most comprehensive belting engineering information in the industry is available through your "U.S." Distributor. Check with him.

"Only 'U.S.' Belts hold up in handling crushed rock"

"We use hundreds of feet of 'U.S. Belting'," says G. H. Lindekugel, Jr. of G. H. Lindekugel & Sons, Mitchell, So. Dakota, "in highway construction and pit deposits. We average 600 tons per hour at our crushing plant. 'U.S.' Belts work 12 hours a day, 6 days a week, carrying rock and gravel. Couldn't find any other belts that could handle our crushed rock for any length of time. 'U.S.' belts have been three years on the job, are in good condition."

Lehigh Portland's Union Bridge plant
HIGHLY CONVEYORIZED

To feed its huge, ever-hungry machinery, crushed limestone, sandstone and shale are carried on an automatic conveying system with "U.S." belting.

The entire system is so trouble-free that one operator (plus an oiler-helper) controls a series of 10 of the "U.S." Belts from console board at quarry.

Massive as this Lehigh plant is, provision for expansion has been designed into the conveyor systems; the superior troughing and stamina of "U.S." Belts will handle greater loads when capacity is increased.

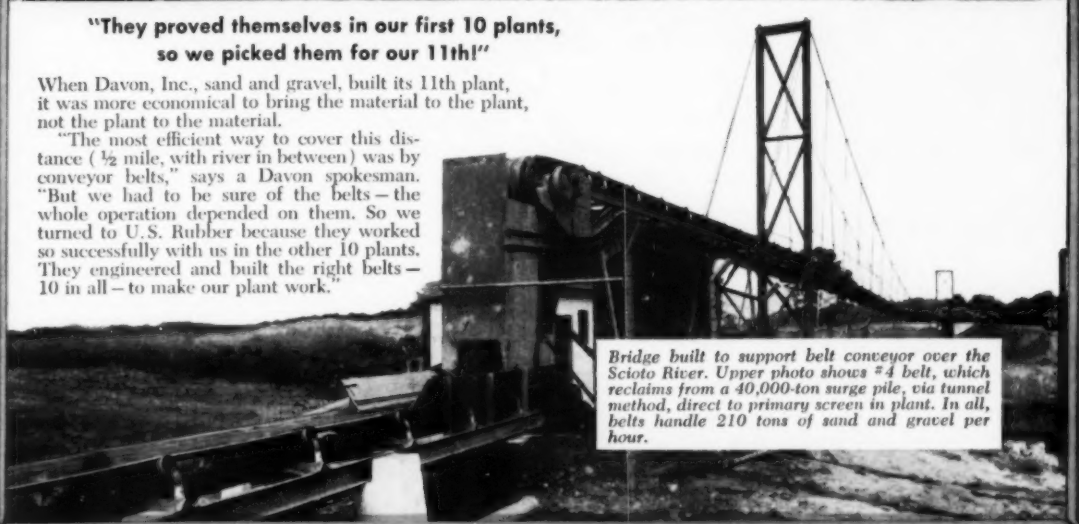
Enter 6 on card, page 169

FAME

"They proved themselves in our first 10 plants, so we picked them for our 11th!"

When Davon, Inc., sand and gravel, built its 11th plant, it was more economical to bring the material to the plant, not the plant to the material.

"The most efficient way to cover this distance (½ mile, with river in between) was by conveyor belts," says a Davon spokesman. "But we had to be sure of the belts – the whole operation depended on them. So we turned to U.S. Rubber because they worked so successfully with us in the other 10 plants. They engineered and built the right belts – 10 in all – to make our plant work."



Bridge built to support belt conveyor over the Scioto River. Upper photo shows #4 belt, which reclaims from a 40,000-ton surge pile, via tunnel method, direct to primary screen in plant. In all, belts handle 210 tons of sand and gravel per hour.

Mechanical Goods Division

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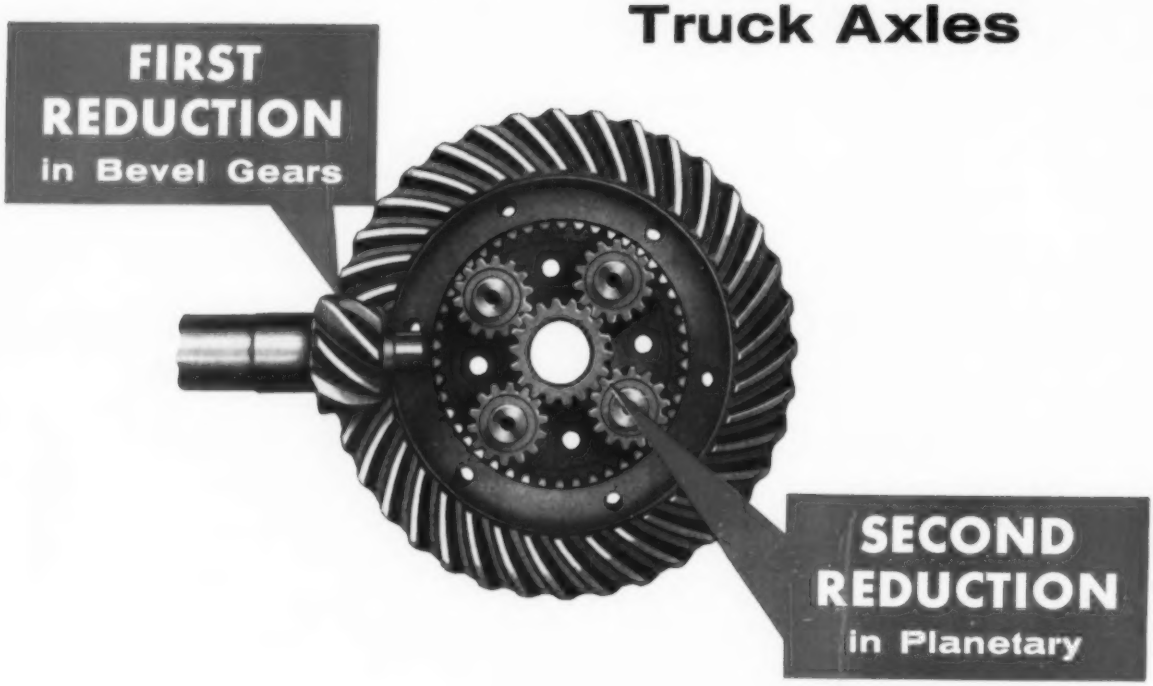
A New Concept in Double Reduction Truck Axles



Eaton Planetary Double Reduction

Gives You these Important Benefits!

Save Weight—Size for size, Eaton PDR Axles weigh less than conventional herringbone or spur gear axles, permit truckers to haul more legal payload.

Last Longer—In Eaton PDR Axles, gear tooth loads are equally distributed over four rugged "planet" gears; stress and wear are reduced, resulting in materially longer axle life. Eaton's forced-flow lubricating system provides positive lubrication to all moving parts, even at slowest vehicle speeds—a feature not available in other double reduction axles.

Cost Less to Maintain—When and if repairs are necessary, parts are readily available—most of them interchangeable with other Eaton Axles. Simple construction—similar to the famous Eaton 2-Speed Axle, with which all truck service men are familiar—holds maintenance labor to a minimum.

Previously, double-reduction axles have been available only in the extra heavy-duty sizes. Eaton PDR Axles are available in a wide range of sizes—the last word in equipment to meet the demands of today's hauling conditions. By actual comparison they cost less to buy, less to maintain. They have established outstanding performance records in all types of heavy-duty operation.

EATON

Ask your Truck Dealer for Complete Information about Eaton PDR Axles

EATON

AXLE DIVISION
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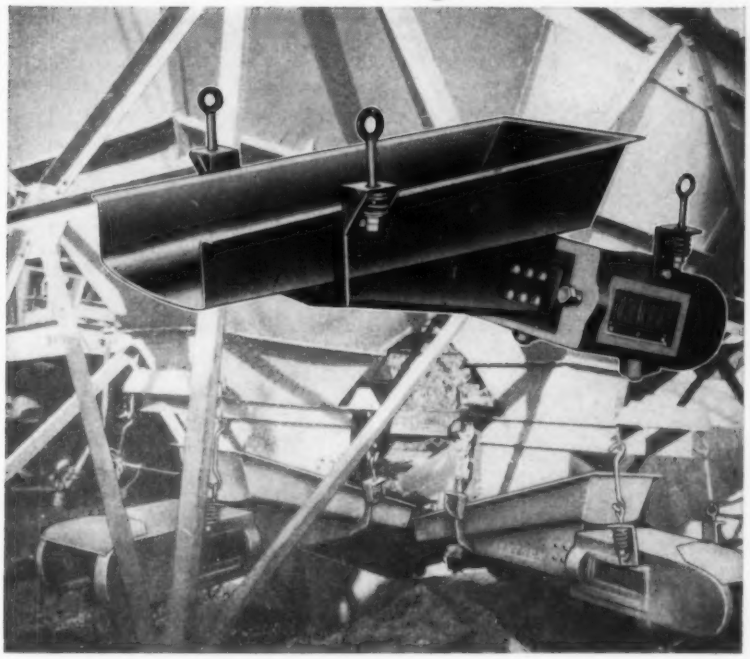
SYNTRON cost-cutting equipment of proven dependable Quality

feed stone at high TPH rates



SYNTRON Vibra-Flow

VIBRATORY FEEDERS

* * * feed rock, aggregate, sand and other bulk materials at rates from pounds to thousands of tons per hour.

SYNTRON Vibratory Feeders give you these features for lower cost production:

—dependable flow feeding of bulk materials to conveyor belts, crushers, screens, etc.

—instant flow control, the power of vibration is instantly controllable for more efficient material flow.

—durable and versatile, withstand heavy load shock and wear by abrasion. Compact, easily integrated into material handling operations.

—operation and maintenance economy—there are no mechanical wearing parts—no lubrication or periodic adjustments required.

Install SYNTRON Vibratory Feeders for dependable, low cost handling of all your bulk materials.

. . . write today for complete catalog data

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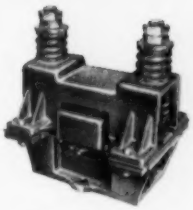
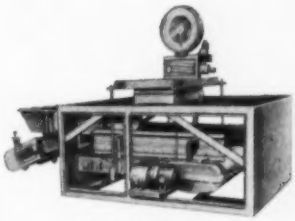
Other SYNTRON Equipment of proven dependable Quality



BIN VIBRATORS

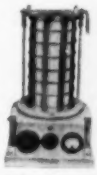
VIBRATING SCREENS

DRY FEEDER MACHINES



WEIGH FEEDERS

TEST SIEVE SHAKERS



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Don't look at the load on the belt . . . look at its edge

Notice the shiny band the edge of the belt has polished on the vertical training idler? Acme-Hamilton forestalls this critical wear condition by building extra-durable square edges on all its belts . . . a good point to file for future reference if edge wear is plaguing you.

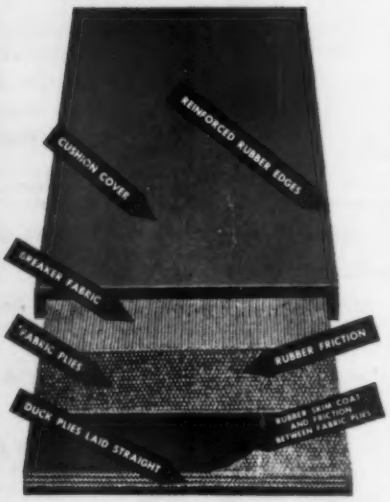
Reinforced Edges and covers defy abrasion, cutting, sharp impacts.

Breaker Fabric. Optional double cord fabric acts as second cushion, increases cover adhesion.

Fabric Plies. Impregnated with rubber to add strength.

Rubber Skim Coat. Provides a resilient bed between plies.

Write Acme-Hamilton, Dept. Q3.



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Washington News Letter

By S. HERBERT UNTERBERGER

NOW that steel will be flowing uninterruptedly, economists, business forecasters, corporation officers, and Government officials are joining in an almost uniform chorus of optimistic economic forecasts for 1960. The only questions seem to be, "How high will the boom go?" and "How long will it last?" Of course, the answer to the second question is dependent on the answer to the first.

The mood, however, appears to be buoyant. Not only do consumers appear to be in a mood to buy but businessmen appear to be revising upward their own plans for capital expenditures. Of more immediate significance, however, is the fact that because of the steel strike and other reasons, inventories have been permitted to decline to a rather low level.

Therefore, there is more than a reasonable expectation that a boom in the first half of 1960 will be supported by the necessity for rebuilding these inventories. The difficulty with inventory prosperities is that they are rather short-lived, and are followed by inventory recessions. In themselves, these are not very serious since they involve rather moderate fluctuations. The problem develops when these inventory movements generate more severe ups and downs.

In that connection, a good deal of attention is given in Washington to a recent speech which was made there by Dr. Arthur F. Burns, former chairman of the President's Council of Economic Advisers. In a farewell address to the American Economic Association, of which he was president for the past year, Dr. Burns discussed the business cycle, and came to the conclusion that "the structural changes in our economy which have recently served to moderate and humanize the business cycle will continue to do so."

Based upon a good deal of evidence which he had collected, he asserted that the cycles which had occurred since the end of World War II were rather short and rather moderate. He did not attribute this to accidental factors, but rather to what he called "structural changes in our economy." Among these he listed many things such as the frequently referred-to "built-in" stabilizers of old age pensions, unemployment insurance, voluntary health and welfare programs, and other arrangements whereby monies begin to flow into the economy when personal incomes decline.

Dr. Burns laid major stress on the anti-cyclical operation of the progressive Federal income tax, whereby when personal incomes decline, the portion of those personal incomes which are paid out as income taxes declines even more rapidly so that the net income available for spending does not fall as fast as the gross income. At the same time, the rapid decline in Government revenues generally unbalances the budget. This forces the Government into borrowing to meet its obligations which, through the complexities of our banking system, has an inflationary result that buoys up the economy.

The structural changes in the way we are using our labor force were also stressed by Dr. Burns. He pointed out that since the war there has been virtually no change in the number of people engaged in manufacturing employment, even though manufacturing output has risen very rapidly. Nevertheless, there has been a substantial increase in the number of people employed. New employment opportunities, therefore, have not come from manufacturing employment which is most sensitive to economic expansion and contraction. He found the expansion to be in white collar employment and in employment in the service industry, both of which are traditionally more stable sources of employment. Principally because he expected these trends to continue, he came to the important conclusion that business cycles would continue to be moderate for quite some time into the future.

Not only Dr. Burns, but virtually every analyst has pointed to the fact of the consumer's willingness to buy, even in the face of uncertain prospects, as a most important change in the economic situation. This fact, perhaps more than any other, indicates the basis for short recessions and rapid recovery. There is no reason to anticipate that this development in consumer behavior is likely to change in 1960.

It would be too much to expect that the prospects are all rosy. The principal areas of difficulty include those industries which are subject to severe foreign competition. The very success which many of the U. S. foreign aid programs have had has resulted in serious problems for a number of U. S. industries. Perhaps the most seriously affected is the textile industry, which must face competition not only from European areas, where textiles can now be made fairly efficiently, but, more importantly, from the Far East, particularly Japan and Hong Kong. In the latter areas, textiles are not only being made with spanking new and efficient equipment, but also at wage rates which are only a small proportion of

(Continued on page 73)

Sauerman DragScraper Digs and Hauls from Pit to Hopper for 8¢ Per Yard

Robert Wilson, Sr., president; Bob Wilson, Jr., treasurer; and Kent Wilson, vice president—Wilson Sand Co.

Track Cable DragScraper inhauling load to hopper from 40 ft. below water.

DragScraper and carrier returning to pit by gravity. Average haul is 500 ft. on a 675-ft. span.

Operating costs for Wilson Sand Co.'s new Sauerman DragScraper are estimated to be less than 8 cents per yd. This includes labor, maintenance and power costs to dig from 40 ft. below water level and deliver 90 yds. per hr. to the field hopper on an average haul of 500 ft.

Wilson Sand Co.'s new 125-tph. plant represents a steady increase in capacity which started with 20 tph. in 1939, using a small Sauerman Slackline.

Sauerman equipment has kept pace with the growth of their Upper Sandusky, Ohio plant. The Slackline was replaced by a 1½-yd. track cable DragScraper in 1951, and with a 2-yd. machine in 1953. The new Sauerman unit is a 3-yd. track cable DragScraper operated by a two-drum electric hoist equipped with air controls.

The DragScraper is digging 35 to 45 ft. under water down to bed rock on a 675-ft. span. The pit bank stands 40 ft. above the water, thus total depth of the deposit recovered by the DragScraper is about 85 ft.

Excellent material and the right equipment to dig and process are responsible for the continued growth of the Wilson Sand Co. Officers of the company are Robert W. Wilson, Sr., President, Kent Wilson, Vice President and Bob Wilson, Jr., Treasurer.

You can cut *your* costs by digging and hauling with a Sauerman Machine sized to match your plant capacity. Track cable Drag-Scrapers dig from high banks, dry pits and deep water. They are built in sizes up to 15 yds. and operate economically on 1000-ft. spans. Start reducing your operating costs—write or call and tell us your job requirements.

After discharging load into field hopper, DragScraper is lifted from pile for return to pit. Conveyor at left leads to plant.

This Sauerman two-drum hoist controls operation of DragScraper.

SAUERMAN BROS., INC. 634 SO. 28th AVE. BELLWOOD, ILL.

Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent DragScrapers • Slackline and Tautline Cableways • Durolite Blocks

Labor Developments

Steel Makes a Political Settlement

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D.C.-Philadelphia, Pa.

IF VICE-PRESIDENT Nixon were running for the office of President today rather than next November, his election would be a virtual certainty—particularly if Secretary of Labor Mitchell were his running mate. And it would be his activity in connection with settling the steel strike that would be principally responsible. There is little doubt that the terms of settlement, which were regarded as impossible on economic grounds, became entirely feasible when political considerations were thrown into the calculations.

In an inverted sort of way, Governor Rockefeller also contributed significantly to the steel settlement; but, of course, he will never get credit for it. By withdrawing from the Presidential race, he made Mr. Nixon a more potent factor to be dealt with in the steel arbitration. After all, he runs a very good chance of becoming President of the United States in the not too distant future.

In view of that fact, the steel companies were certainly much more willing to listen to his suggestions, and even to accept them. At the same time, the fact that the steel industry did accept them, knowing full well that this was supplying him with extremely important support, was a point of major political consequence.

There was, of course, some attempt to spread the credit for this achievement. Thus, Secretary Mitchell was given the privilege of announcing the settlement during which he made it abundantly clear that but for the activity of the vice-president there would have been no settlement to announce. Also, the point was repeatedly made, principally by presidential press secretary Hagerty, that the vice-president was operating under specific instructions from President Eisenhower, and was in close communication with him throughout the difficult mediation period.

The principal political benefit, however, is hardly that the steel companies would support the obvious Republican choice for the presidency — they have practically no other place to put their support. The important point is that the very large and extremely influential steel workers union has been politically immobilized. To follow their usual practice of giving active support to whichever Democratic candidate is nominated would be an act of ingratitude.

It should be remembered that it was not the steel companies but the president of the union who first enlisted Mr. Nixon's help in this dispute. It would probably be too much to expect the steel workers union, or even its officers, to announce their support of Mr. Nixon for the Presidency. However, he can look forward to a form of negative cooperation unless he makes serious mistakes in his relationship with them between now and November. It will be no surprise to find that the union officials will be very busily engaged with their own problems around election time, and probably will not be able to find very much time to campaign for even their traditional candidates. This could make all of the difference in such politically important but uncertain states as Pennsylvania, Illinois, and Ohio.

There will be many inquiries about how it was possible for Mr. Nixon to get the steel companies to agree to the settlement made—one that was approximately one-third more costly than their absolutely final offer presented to a presidential board less than one week before the settlement. A part of the answer was supplied by Roger M. Blough, chairman of the United States Steel Corporation, almost immediately after the settlement was announced. At that time he pointed out that it was clear that the union would not accept the companies' final offer but was ready to strike in order to obtain better terms. It was similarly clear that the government would not permit the nation to be paralyzed by such a strike. The alternatives, therefore, were either to make a settlement, or to have one imposed by new legislation which might involve compulsion.

Mr. Blough then stated, "And looking down that long, unhappy road in the light of the steel industry's past experience, it was apparent to us that an enforced settlement would be no more favorable than the one which the government had proposed to us; and that in the process of reaching that enforced settlement, not only the companies but the steel workers and the nation might suffer serious consequences.

"And, finally, it was evident to us after much study and exploration of the matter that the terms which had been carefully worked out by government officials were probably the only terms which could conceivably win even reluctant acceptance from both sides."

The story seems pretty clear. The vice-president's role was that of outlining to the steel companies what treatment, in his best judgment, they were likely to receive at the hands of Congress. In this matter, he is, no doubt, an expert. He undoubtedly pointed out the two rather important

(Continued on page 73)

WORLD'S EASIEST HANDLING CRAWLER

62 gross engine h.p. with 1-yd. loader

Take the controls of a new Oliver Trans-O-Matic OC-96 Loader —and "let the tractor do the talking!"

Power shifting plus power steering (with three types of turns) makes the startling difference! The OC-96 is *so easy* to operate, it simply cannot be compared with older designs on this count—*or any other!*

You sit in a spacious, foam-rubber seat (offset for ideal visibility)...have full-freedom leg room in the wide, flush-deck compartment.

As for the controls, they're practically "in your lap." Levers for *power* steering, *power* reverse and *power* shift are placed directly ahead of the seat. Your arms are in "resting" position all the time. To brake or foot-steer, pedals do the job just as effortlessly.

Easy operation, indeed! The *easiest* you ever had—plus.

NEW! 3 types of power turns—The only crawler its size giving you counter-rotation turns for about-faces in the tractor's own length—also spot turns and gradual turns.

NEW! Power shifting—Shift from forward to reverse instantly, on the go. No clutching, no gear-clashing with Oliver's all-hydraulic Trans-O-Matic transmission. Four speeds in high or low range—forward to 6.05 m.p.h., backward to 8.07 m.p.h.

NEW! Torque converter—The OC-96 has heaviest-duty torque converter (not automotive kind)—delivering full engine power for digging and crowding in fastest non-stalling operation. Advanced 62 gross h.p. diesel.

NEW 1-yd. loader design—See how the OC-96 is an *integral* tractor-loader minus high, hung-on parts and cross members. Loader side pedestals are actually part of the tractor for low profile, high stability, finest visibility and safety. Fast breakout, greatest dumping reach. No other its size has such rapid work cycle—is so rapid-reversing.

LOOK TO OLIVER FOR YOUR BEST BUY IN WHEEL AND CRAWLER TRACTORS

THE OLIVER CORPORATION

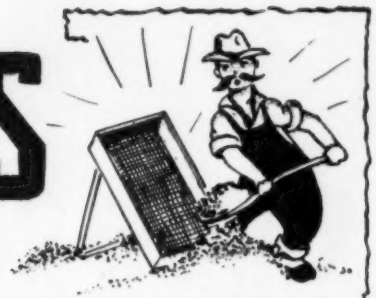
Dept. 2232, 400 W. Madison St., Chicago 6, Illinois

"I save 12¢ per ton with my OC-96," says Mr. John Zanella, owner-operator of Zanella Brothers, Mt. Carmel, Pa. "Not only that, it does the work in the same amount of time it used to take with our former machine with a 1½-yd. bucket."

More and more owners and operators are finding out the same thing—with the OC-96 loader they can get more work done for less money...easier and faster than ever before. No matter what your loader operations, why not find out for yourself how you can benefit from the OC-96? Ask for a work test on your job, today!

NEW CATALOG—"must" reading for cost- and comfort-conscious tractor users.

SCREENINGS



By RAY L. SMITH JR.

SHORTLY after this issue is off the press, a sizable number of our readers will be gathering in Chicago to ride the Merry-Go-Round at the annual conventions of the National Sand and Gravel Association and the National Crushed Stone Association.

During that two weeks, groups of producers will meet together with a sincere desire for knowledge of up-to-date methods. When the will to do a better job is present, progress down the line is amazing.

There is something about an annual gathering that encourages an inventory of old mistakes to be avoided; the planning of new ways for progress; the setting up of specific goals by which achievements can be measured. We hope having someone in your organization attend the convention has been made a part of your program. There needs to be someone in your company responsible for putting fuel on the fire, and naturally the intention is that "fuel" shall be acquired at the convention. Everyone should expose themselves to the things others are doing.

What should be said to the man—a good man normally—who has fallen into a rut of self-satisfaction, thinks he is not appreciated, and makes it plain his company is about to suffer a great loss unless his treatment and salary improve? Should the boss say: "Quit and be damned"? Obviously not. But this "corny" poem might get some good results.

Sometime, when you feel that your going
Would leave an unfillable hole,
Just follow this simple instruction,
And see how it humbles your soul.

Take a bucket and fill it with water,
Put your hand in it up to your wrist,
Pull it out, and the hole that's remaining
Is the measure of how you'll be missed.

You may splash all you want as you enter,
You may stir up the water galore;
But stop, and you'll find in a minute
That it looks quite the same as before.

The moral in this quaint example,
Is just do the very best you can,
Be proud of yourself, but remember
There is no indispensable man.

Potpourri and Succotash

Two cement mixers ran off and got married. Now they have a little sidewalk running around the house.

Then there was the cub reporter who was assigned to cover the class play at the high school. He wrote: "The auditorium was filled with expectant mothers and fathers, eagerly awaiting the appearance of their offspring."

An editor who was noted for his caustic wit received a lengthy verse written on perfumed paper and tied with pink ribbon, from a contributor. The title of the poem was "I Wonder Will He Miss Me?"

The editor read the poem, frowned, and returned the material with a note saying: "Dear madam, if he does, he should never again be trusted with firearms."

"I want some elephant cartridges," said the customer:

"Certainly sir, how many?" inquired the clerk.

"Oh, about a thousand," replied the customer.

"May I inquire, sir," asked the surprised clerk, "why you wish so many?"

"Because," replied the customer, "I hate elephants."

It costs me not a jolt nor jar
To learn the cost of caviar
Or note the current price report
On lobster, pheasant and the sort.
A philosophic shrug for these
Expendable commodities.
(Which calm and stoic stand I take
Vanishes at the thought of steak.)

After several minutes of futile stabbing at the keyhole, the tipsy man found the door opened for him by his glaring wife.

"Aw, honey, don't be mad," he mumbled. "Some of the boys at the office decided to have a contest to see who could drink the most beer."

"Very interesting," said the wife acidly, "Who won second prize?"

A fish registered at a piscatorial hotel located on the bottom of a lake. From the first, he was a headache. He changed his room many times, never finding one that suited him. He constantly criticized the cuisine. He disparaged the service. Scarcely a day passed when a complaint of his did not reach the manager.

"Now look here," the manager, an elderly trout, said to him one morning. "It isn't usual for me to speak my mind to a guest. You are, without doubt, the biggest fault-finder we've ever had in this hotel."

The griping fish sighed. "Very probably," he said. "But I can't help it. I've simply got to find fault. You see, I'm a carp."

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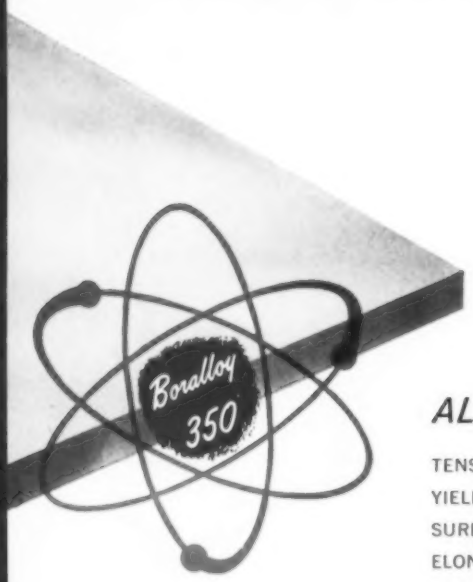
PACAL

A SUPER STRENGTH ABRASION

a new steel alloy designed



Pacal's new *Boralloy* 350 is made with Boron to achieve a Brinnel hardness of 350. Abrasion resistance is high, making new Boralloy an economical material for tortuous aggregate and ore application. Boralloy's superior structural strength requires less component weight and bulk and greatly increases length of use. Boralloy 350 plates are stocked only at Pacal and in sizes 3/16″ to 2″ thick, 36″ to 110″ wide and 10 ft. to 20 ft. in length.

ALLOY HEAT TREATED PLATE SPECIFICATIONS

TENSILE STRENGTH	150,000 psi. min.
YIELD STRENGTH	140,000 psi. min.
SURFACE HARDNESS BHN	364 min.
ELONGATION IN 2″	15% min.
REDUCTION IN AREA	55% min.
V NOTCH IZOD	87 ft. lb.
KEYHOLE CHARPY	45 ft. lb.

WELDABILITY

For best results in welding Boralloy 350 use a low hydrogen electrode preferably AWS E12015 or comparable. Before welding plates ¾″ or thicker, preheat 200-600°F. Never weld any plate when temperature is under 60° F.

PAPER-CALMENSON & CO.

2502 WEST COUNTY ROAD B
ST. PAUL 13, MINNESOTA
PHONE: Midway 6-9456

Boralloy-350

RESISTANT STEEL PLATE

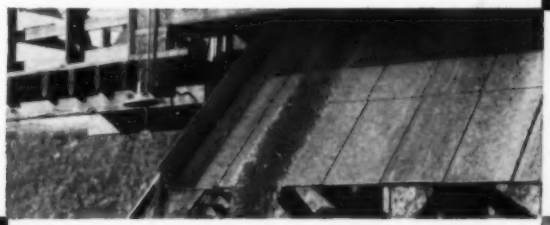
for longer life in tough jobs

Boralloy 350 has a high tensile strength (150,000 psi) and resistance to shock.

Boralloy 350 resists corrosion and is equally serviceable in both wet and dry application.

Boralloy 350 can be drilled and machined with standard equipment by reducing speeds and using coolants.

Boralloy 350 welds normally in thicknesses of ½" and under, without stress-relieving. Thicker plates may be welded by preheating and stress-relieving.



P&C

USES FOR BORALLOY 350:

- SCOOPS
- BUCKETS
- CHUTES
- TRUCKS
- CONVEYORS
- SCREENS
- BAFFLE PLATES
- HOPPERS
- BINS

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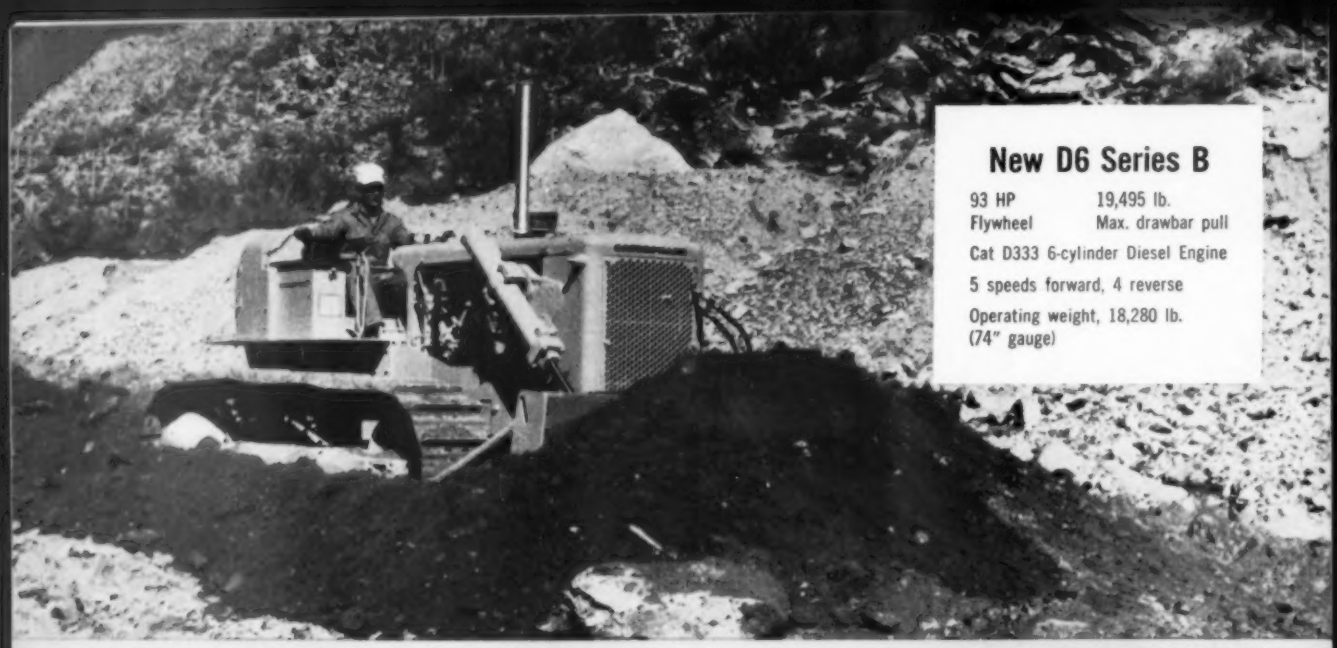


New D6 Series B

93 HP Flywheel — 19,495 lb. Max. drawbar pull

Cat D333 6-cylinder Diesel Engine

5 speeds forward, 4 reverse

Operating weight, 18,280 lb. (74″ gauge)

RUGGED MATCHED ATTACHMENTS for the D6 and D4 include Bulldozers, Tool Bar, Scraper, Rock Rakes, Winches, K/G Blade, Rippers and others.

New D4 Series C

65 HP Flywheel — 13,000 lb. Max. drawbar pull

Cat D330 4-cylinder Diesel Engine

5 speeds forward, 4 reverse

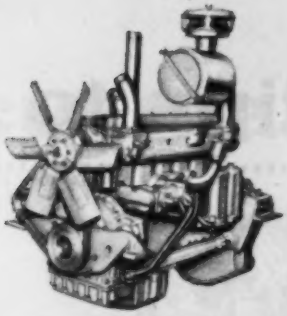
Operating weight, 11,710 lb. (60″ gauge)

IMPROVED STARTING ENGINE for both tractors has recoil starter for fast starts. Also 12-volt in-seat starting available. 24-volt direct electric starting optional.

CATERPILLAR ANNOUNCES the

completely redesigned for faster and greater production

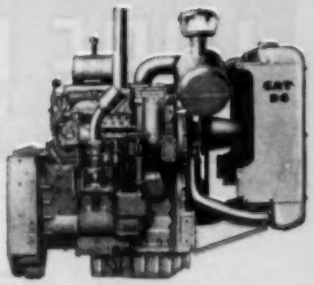
There's no time like now to upgrade your equipment spread. These two new tractors not only look different—they are different. Each, in its own class, answers your needs for higher production and greater operating economy. Some of their important new features are described on these pages. In addition to these improvements, each machine provides other famous Caterpillar features... the dry-type air cleaner,



D6 93 HP 6-cylinder Engine
Maximum drawbar pull, 19,495 lb. The D333 Engine provides power with dependability for a long life of economical operation.

New Caterpillar Diesel Engines deliver 25% more lugging ability

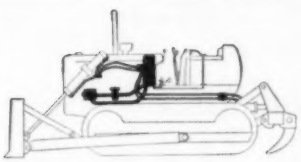
For the D6 and D4, two completely new Cat Diesel Engines. 25% more lugging ability. New compactness with new ruggedness. Famous Cat fuel injection pumps in new, easily serviceable housing. New direct acting governor that makes quick fuel adjustments, picks up loads fast. New, improved gasoline starting engine.



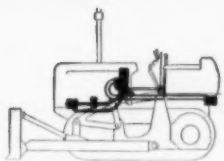
D4 65 HP 4-cylinder Engine
Maximum drawbar pull, 13,000 lb. New design of the D330 results in smooth, vibration-free performance in all speed ranges.

New integral hydraulic systems put more power where you need it

More work power at the tools—that's one of the big advantages of these new Cat hydraulic systems. Under-the-hood mounting of tank, pump and valves permits convenient routing of hydraulic lines to bulldozer or implement cylinders, frees front and rear for mounted equipment. Center-pivoted cylinder mounting on D6 gives increased blade lift/drop range for greater production. Hydraulic control system provides hand control for bulldozer and/or ripper, foot control for tilt cylinder on D6.



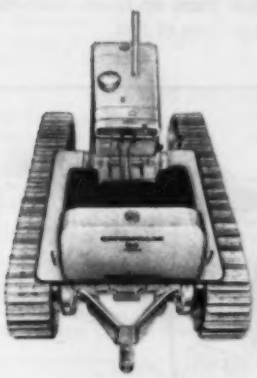
D6 Integral Hydraulic System
No. 165 Hydraulic Control for bulldozer
54 GPM Pump—1500 PSI
No. 143 Hydraulic Control for No. 6 Tool Bar
29 GPM Pump—1700 PSI



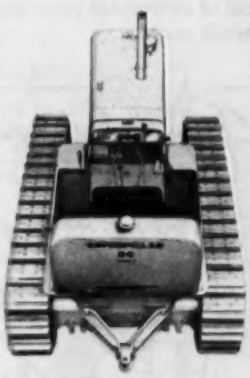
D4 Integral Hydraulic System
No. 143 Hydraulic Control with:
29 GPM Pump—1700 PSI for bulldozers
17 GPM Pump—1700 PSI for tool bars

New operator convenience and comfort in co-ordinated compartments

The cockpits are all new. Controls are co-ordinated to make one motion flow into the next, reducing hand movements and speeding every operation. Forward-reverse lever (new on the D4) is next to the operator's right hand to speed 'dozer cycle times. Short-travel transmission speed selector shifts gears easily, quickly. Boosters for steering clutches save muscles . . . increase efficiency.



D6 operator's compartment



D4 operator's compartment

New D4 Series C and D6 Series B Tractors

hydraulic track adjusters, lifetime lubricated track rollers, the oil clutch, the forward-reverse lever. Your Caterpillar Dealer will be happy to give you the complete facts about both the new D6 and the new D4 and demonstrate them on any of your jobs. The tougher, the better.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

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BORN OF RESEARCH
PROVED IN THE FIELD

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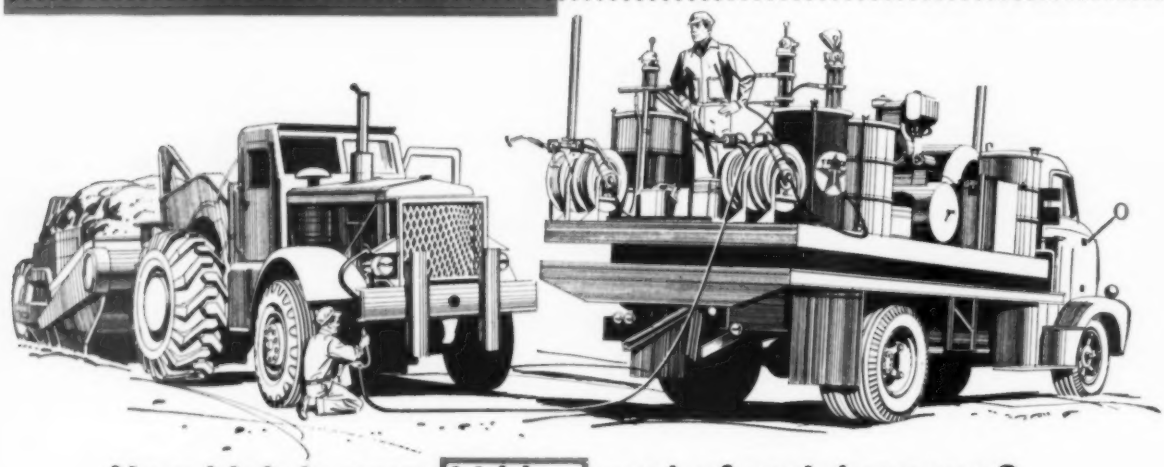
LUBE LOGIC

Six tips to

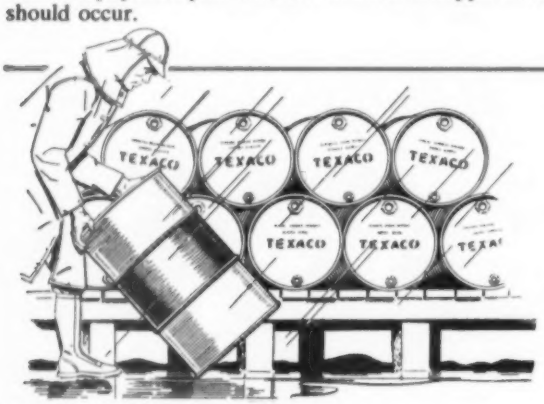


How high is your hidden cost of maintenance?

You may not realize how many extra maintenance dollars you spend when you keep many different lubricants on hand. (Six are often all you need to cover all major maintenance.) You pay extra for inventory. You pay extra for storage and handling. It costs you more in paperwork to order. And you'll have to figure the wasted cost of equipment parts and downtime if misapplication should occur.

The Texaco Lubrication Plan helps you reduce or even eliminate these hidden costs. That's because it provides the minimum number of *proven* multi-purpose and special lubricants, tailored to your job requirements.

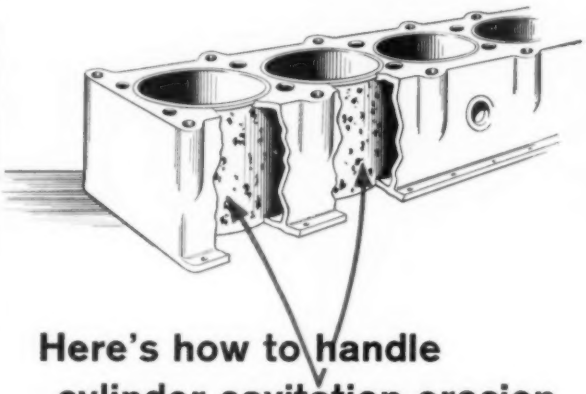
You'll do yourself a favor when you check with a Texaco Lubrication Engineer. He'll carefully plan your lubrication needs—then follow them up to see that your lubrication problems are taken care of fast.



The inside story on outside storage

You're short-changing yourself if you skip these simple precautions: drums stored outdoors should be placed on their sides. When stored on end, expansion and contraction through temperature changes can suck in rain water that collects on top of the drum.

Want to warm up lubricants that have become stiff from cold? *Don't* heat them with an open flame. You might melt the sealing compounds, and the drum will leak. You might also damage the product with too much heat in one spot. Put the drum indoors for a while before using.



Here's how to handle cylinder cavitation erosion

High pressure cooling systems in use in most supercharged diesels are subject to coolant aeration. This aeration can cause cavitation, leading to serious cylinder liner corrosion-erosion, unless a rust preventive is added to the water. A good antifreeze (like Texaco PT antifreeze) will do the job in winter—but in summer a 1% to 2% solution of Texaco Soluble Oil C will do a fine job. (Remember to flush out before you add antifreeze again.)

cut maintenance costs

OIL GAUGES SPEAK A LANGUAGE ALL THEIR OWN

Look to your oil gauge pressure for clues to a variety of potential engine ailments. For example:

LOW OR NONE

1. Oil pump pickup stuck high.

LOW

1. Clogged oil pump screen.
2. Excessive main, con-rod, camshaft or rocker-arm bearing clearances.
3. Clogged full-low filter, if by-pass isn't working.
4. Excessive dilution of oil with fuel.
5. Enlarged squirt holes.
6. Loose connections or cracks in oil line.

LOW OR ERRATIC

1. Faulty oil pump.
2. Restriction in oil pan, or oil too viscous to keep oil pump intake supplied.

LOW OR HIGH

1. Faulty gauge.
2. Ineffective oil cooler depending on type, may keep oil too cold or provide insufficient cooling.

HIGH

1. Oil with viscosity too high for climate.
2. Sludge and contamination in the oil.
3. Clogged oil passages on the pressure side.

HIGH, LOW OR ERRATIC

1. Improper setting or failure of pressure relief valve.

ERRATIC, LOW, THEN NONE

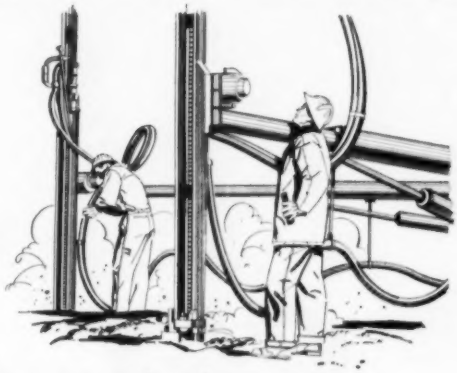
1. Crankcase oil level just at or below oil pump pickup.

NO MOVEMENT OR DELAYED ACTION

1. Clogged line to gauge.

Don't let engines foul up!

If the fuel injector on a diesel drifts off or "dribbles," incompletely burned fuel will contaminate the crankcase. The result will be plenty of smoke—and probably engine trouble. The injector should be fixed immediately—but if it can't be, start shortening drain periods to remove the damaging oil-fuel mixture. Also, use an oil with full detergent and dispersion properties to keep other undesirable products out of the engine.



New product for rock drill couplings

Actually, it's an old friend, Marfak Heavy Duty #2, in a new application. According to the raves from customers who've tried it, the lubricant works better on rock drill couplings than anything they've ever used.

TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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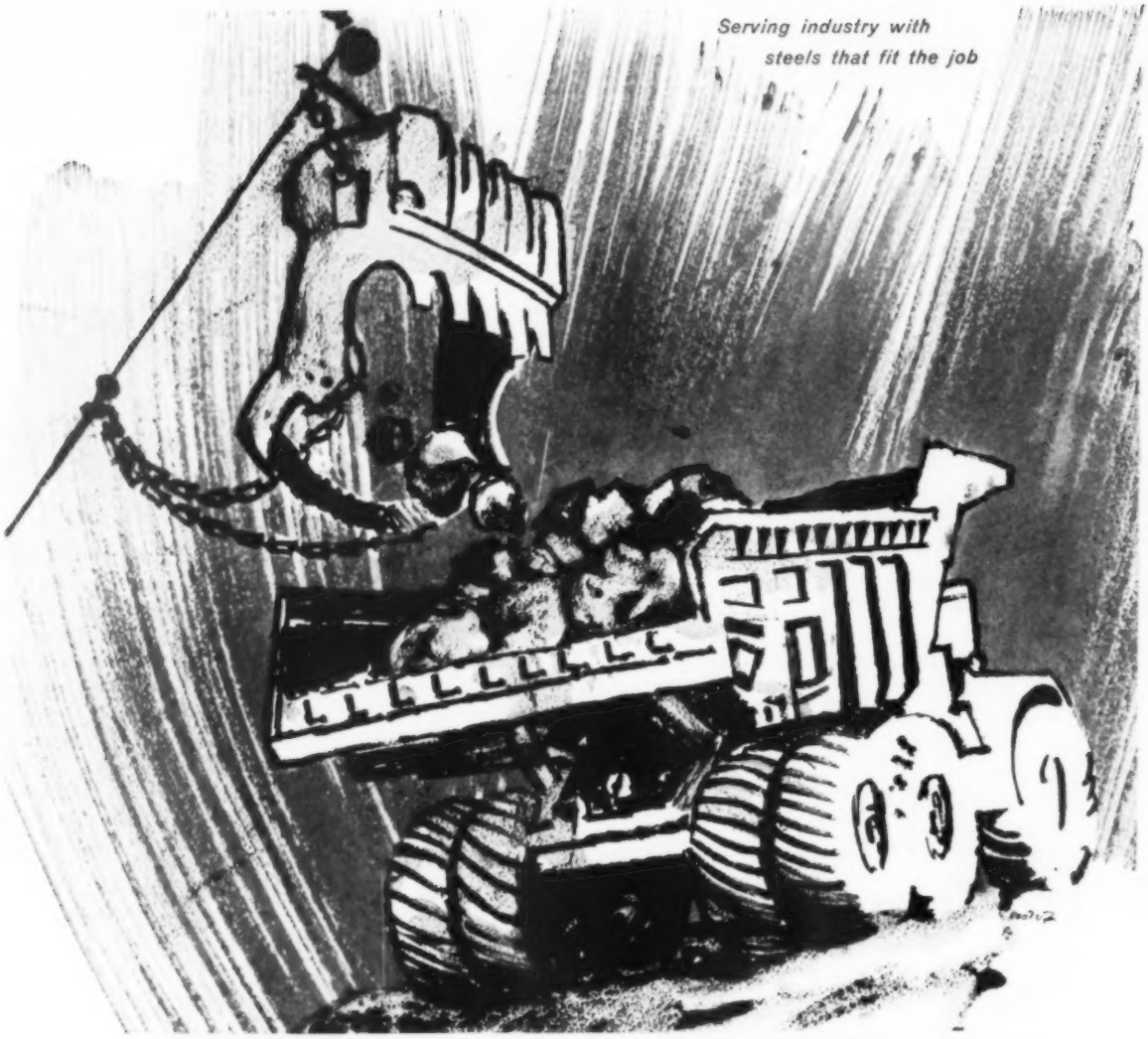

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TRADEMARK

Where the going gets rough, versatile Lukens "T-1" steel fights back. For repair or modification of heavy duty equipment such as truck beds, chutes, bucket teeth and dozer blades, this special duty steel plate can be ordered from *warehouse stock* in a wide range of plate sizes and gages. Lukens "T-1" is the modern mining steel—you can work and weld it in the field as readily as in your shop. Its terrific resistance to abrasive impact—coupled with an extremely high yield strength—means fewer replacements and often greater payloads. That's why more and more equipment builders are using Lukens "T-1" to provide longer life in shovel buckets, trucks and other mining equipment. Remember to specify the extra-tough 321 min. BHN quality. For performance and application details, request our special booklet, "Lukens 'T-1' for Toughness." Address Manager, Application Engineering Dept., 020 Services Bldg., Lukens Steel Company, Coatesville, Pennsylvania.

You can order Lukens "T-1" steel plate from these Steel Service Centers:

Alabama, BIRMINGHAM 2, O'Neal Steel, Inc., P.O. Box 2623 • **California,** LOS ANGELES 54, Earle M. Jorgensen Co., P.O. Box 2358, Terminal Annex, 10650 S. Alameda St. • LOS ANGELES 33, The R. J. M. Company, 238-248 South Mission Rd. • **Illinois,** CHICAGO 8, Joseph T. Ryerson & Son, Inc., 16th and Rockwell Sts. • **Kentucky,** ASHLAND, Mansbach Steel Co., 19th St. and River Front • **Maryland,** BALTIMORE 2, Wm. G. Wetherall, Inc. 317 President St. • **New Mexico,** ALBUQUERQUE, Miller and Smith Mfg. Co., Inc., 500 Phoenix Ave., N. W. • **Ohio,** CLEVELAND 6, Mills-Wolf Steel Co., 12434 Cedar Rd. • **Oregon,** PORTLAND 4, J. E. Haseltine & Co., 115 S. W. Second Ave. • **Pennsylvania,** McKEES ROCKS, Follansbee Steel Co., 200 Bradley St. • **Quebec,** MONTREAL, Drummond, McCall & Co., Ltd. 930 Wellington St. • **Utah,** SALT LAKE CITY, Structural Steel & Forge Co., P. O. Box 300 • **Washington,** SEATTLE 4, Stack Steel & Supply Co., 500 Landers St. • SPOKANE 10, Union Iron Works, East 217 Montgomery Ave., P. O. Box 2135.

LUKENS (R)

News of the Industry

Midwest Quarries, Inc. Formed by Stanley Group To Operate Lime Plant

Plans have been announced by the Stanley Interests, Kansas City, Kans., for the construction of a lime plant near Bonner Springs, Kans. The newly formed concern, which will operate the plant—Midwest Quarries, Inc.—will have headquarters at the site, adjacent to the Loring quarries.

The high-calcium lime deposit to be worked is a part of an extensive tract owned by the Stanley Interests. It was established recently through a geological survey that the valuable deposit, 24½ ft. thick by 1½ miles wide, runs across the tract, and that it comprises a reserve sufficient for many decades of operation.

Construction on the plant will begin at once. Work has been started on the first vertical kiln, which will be 40 ft. high and fired with natural gas. Other kilns will be added when demand warrants expansion.

According to Robert Stanley, company president, present equipment will handle approximately 100 t.p.d. Mr. Stanley also stated that finished lime should be ready for shipment about May 1.

Officers of the firm, in addition to Robert Stanley, include the following: Guy Stanley Jr., vice-president; and Joseph McDowell, secretary. Guy Stanley Jr. is also president of the Loring Quarries, the Natural Storage Company (near Bonner Springs), and Concrete Materials Company, Kansas City, Kans.

Program plans for the National Slag Association's Plant Operators Committee meeting are being arranged. The sessions will be held on March 31 and April 1 at the Jack Tar Hotel, Galveston, Tex.

Multimillion-Dollar Plan Announced to Modernize Calif. Portland Plant

California Portland Cement Company spokesmen have announced that the firm will launch a multimillion-dollar modernization program at its Colton plant. It was indicated that the dust-collecting systems alone will cost $2,000,000. Modernization is contemplated for virtually every part of this facility, which has been in operation since 1891.

Included in features to be added are two new kilns, which will have a combined capacity of nearly 4,000,000 bbl. of clinker per year. Other items will be new raw-grinding and finish-grinding departments, cement storage silos, bulk-loading facilities, and technical equipment.

It is anticipated that there will be no interruption in plant operations during the installation of new equipment.

Coming Events

February 14-18, 1960—New York. Annual meeting, American Institute of Mining, Metallurgical and Petroleum Engineers. Statler Hilton and Sheraton-Atlantic Hotels.

February 15-19, 1960—Chicago. Combined biennial show, joint convention, National Sand and Gravel Association, and National Ready-Mixed Concrete Association. The Coliseum, and Conrad Hilton Hotel.

February 22-24, 1960—Chicago. 43rd annual convention, biennial manufacturers division exposition, National Crushed Stone Association. Conrad Hilton Hotel.

February 22-24 — Los Angeles. 40th annual convention, National Concrete Masonry Association. Hotel Statler.

March 14-17, 1960—New York City. 56th annual convention, American Concrete Institute. Commodore Hotel.

March 31-April 1, 1960—Galveston. Plant Operators Committee meeting, National Slag Association. Jack Tar Hotel.

May 17-19, 1960 — Milwaukee. Second Technical Conference of Cement Industry Sub-Committee, The American Institute of Electrical Engineers. Hotel Pfister.

May 23-25, 1960—Sea Island, Ga. Annual convention, National Lime Association. The Cloisters.

June 26-July 1, 1960—Atlantic City. 63rd annual meeting and apparatus exhibit, American Society for Testing Materials. Chalfonte-Haddon Hall.

Construction Awards Drop, November Totals Lower Than 1958 and Oct., 1959

Sharp declines in contracts for highways and housing caused the total for future construction contracts in November to drop 9 percent below a year ago, according to F. W. Dodge Corporation. Total contracts amounted to $2,372,826,000 —down about $220,000,000 from November, 1958. The figure is also sharply down from last October's $3,134,500,000.

On a seasonally adjusted basis, the Dodge Index of construction contracts fell to a level of 231 in November from 278 in October, and 269 in September (1947-49 = 100).

Items: highway contracts were nearly $200,000,000 below the November, 1958, level; housing contracts fell by a little more than $100,000,000; heavy engineering construction amounted to $479,796,000 —a decline of 22 percent from November, 1958; public works contracts were down sharply, chiefly as a result of the highway contract drop; utility contracts were also down from a year ago, despite a notable gain of 30 percent in contracts for electric light and power systems. *A bright spot: contracts for manufacturing buildings rose about $87,000,000 over November, 1958—a gain of 90 percent.*

Residential building contracts totaled $1,092,379,000—down 9 percent; non-residential building contracts totaled $800,651,000—up 3 percent.

Cumulative totals for the first 11 months of 1959 and the percentage changes from the comparable 1958 period: total construction—up 4 percent to $34,069,330,000; nonresidential building—up 4 percent to $10,611,838,000; residential building—up 18 percent to $16,164,806,000; and heavy engineering —down 18 percent to $7,292,686,000.

Construction Costs in 1960 Begin Upward Movement

Spurred by cement price increases, a firmer lumber market, and a number of deferred wage increases for construction workers, the 1960 push toward higher construction costs is off to an early start, according to *Engineering News-Record.*

The 20-cities Construction Cost Index stands at 811.98, only a shade below the September, 1959, record peak of 812.56.

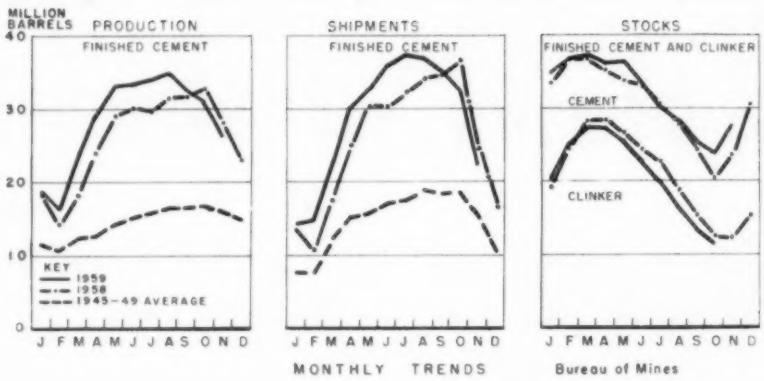
Higher wages for both skilled and common labor have the greatest influence in boosting costs.

Giant Portland Expansion To Cost About $4,000,000

Construction will begin shortly on a $4,000,000 expansion of the Giant Portland Cement Company facilities at Harleyville, S. C. A fourth kiln will be added, with an annual capacity of 1,100,000 bbl., boosting plant capacity to 4,000,000 bbl.

Additional shipping and storage facilities will also be added. A sales office will be established in Raleigh, S. C.

The plant went into operation in 1948 and since has been enlarged twice.



—November, 1959, Finished Portland Cement—

SUMMARY—Production of finished portland cement in November, 1959, as reported to the U. S. Bureau of Mines, totaled 26,100,000 barrels—a decrease of 7 percent, compared with November, 1958. Mill shipments in November, 1959, totaled 22,025,000 barrels—a decrease of 10 percent, compared with November, 1958. Stocks of 27,794,000 barrels of finished portland cement on hand November 30, 1959, were 17 percent higher than those on hand November 30, 1958. Clinker production during November, 1959, totaled 27,547,000 —a decrease of 0.4 percent compared with the November, 1958, figure.

PRODUCTION—One hundred sixty-nine (169) plants in 38 states and Puerto Rico reported a production of 26,100,000 barrels of finished portland cement during November, 1959, compared with 28,031,000 barrels produced in November, 1958.

Production of clinker during the month of November, 1959, was 27,547,000 barrels, compared with 27,669,000 barrels during the same month last year.

High-early-strength portland cement in November, 1959, totaled 1,285,000 barrels—an increase of 13 percent over the November, 1958, production.

Prepared masonry cement production in November, 1959, of 1,186,000 barrels decreased 15 percent from the November, 1958, production.

SHIPMENTS—Mill shipments of finished portland cement for November, 1959, totaled 22,025,000 barrels, compared with 24,528,000 barrels in November, 1958.

In November, 1959, shipments were higher in 6 districts and lower in 17 districts than in November, 1958. The greatest increases were in the Puerto Rico, New York-Maine, and Georgia-Florida districts. The greatest decreases were in the western Pennsylvania-West Virginia, Iowa, and Indiana-Kentucky-Wisconsin districts.

Mill shipments of high-early-strength portland cement totaled 1,111,000 barrels—an increase of 3 percent over the 1,083,000 barrels shipped in November, 1958.

Mill shipments of prepared masonry cement in November, 1959, totaled 1,034,000 barrels—a decrease of 12 percent from the 1,178,000 barrels shipped in November, 1958. Over one-half of these shipments were from mills in the northern states east of the Mississippi River. Prepared masonry cements are shown in 376-lb. barrels, although they are sold in barrels of varying weights.

STOCKS—Mill stocks of 27,794,000 barrels of finished portland cement were on hand November 30, 1959—an increase of 17 percent over the 23,686,000 barrels on hand November 30, 1958. Stocks of clinker on hand November 30, 1959, totaled 13,130,000 barrels—an increase of 8 percent over the 12,124,000 barrels on hand November 30, 1958.

FIRST ELEVEN MONTHS OF 1959—For the January-November period, the volume of production of finished cement amounted to 314,416,000 barrels, compared with 287,729,000 barrels in the comparable period of 1958. Total shipments for the first eleven months of 1959 are reported at 314,708,000 barrels; in the same period of 1958 total shipments were 290,417,000 barrels. (Shipment figures do not include finished cement used in the manufacture of prepared masonry cement, as follows: November, 1958—230,000 barrels; January-November, 1958—2,440,000 barrels: November, 1959—194,000 barrels; January-November, 1959—2,665,000 barrels.) ●

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"Our EAGLE LOG WASHER is taking out the plastic clay and doing a great job!"

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For washing rock or crushed stone the Eagle Double Log Washer has no equal. Material is immersed for sufficient time so that the corrugated paddles can abrade and scrub every piece of material. Plastic clay balls and soft stone are broken up or worn away and washed out by the water currents rising from the bottom of the washer tub. Cemented aggregates and conglomerates are loosened up. Material is freed of water as it is conveyed up the drainboard to the discharge opening.

Mason-Dixon Sand & Gravel Co. of Pa., uses an Eagle Double Log Washer with 36" dia. logs in a 30' tub length. Material fed to it is ½" to 2½".

Send a sample of your material for a free test run and report from Eagle's engineers and laboratory technicians—ask for shipping instructions. Also ask for Catalog 58.

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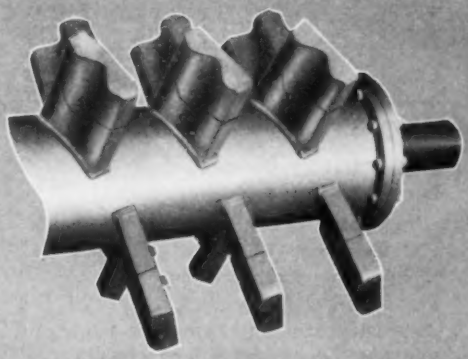


"Way ahead design" includes two-piece paddle shoes

Indicative of Eagle's superior engineering and advanced design are the two-piece Ni-Hard wear resistant alloy shoes, which are bolted to the paddles welded on the log shaft. Top half of shoe, which receives brunt of wear, can be replaced without disturbing bottom half. Totally enclosed compound gear drive in oil bath is another maintenance cost cutting feature.

EAGLE COARSE MATERIAL SCREW WASHER-DEWATERERS

Single and double screw units. For processing coarse material. Scrubs every particle, loosening and washing out silt, clay and other foreign matter. Special models with Trash Removers for removal of chips, coal, vegetation and other buoyant material. Also auxiliary Shale Removers.

Name Schemm President, Townsend Chairman Of Huron Portland Cement

H. Ripley Schemm has been elected the fourth president of Huron Portland Cement Company, succeeding Paul H. Townsend, who retired last December from that office. Mr. Townsend continues as chairman of the board of directors of Huron, and as a director of National Gypsum Company, of which Huron is a subsidiary. (See accompanying box.)

Mr. Schemm joined Huron in 1925, when he became assistant to Mr. Townsend. He has also held the following positions: assistant general manager, vice-president in charge of operations, and executive vice-president. He is also a director.

Huron Portland Cement's fourth president is H. Ripley Schemm, who was named to succeed Paul H. Townsend, now the chairman of Huron's board of directors. (See accompanying story.)

H. R. Schemm

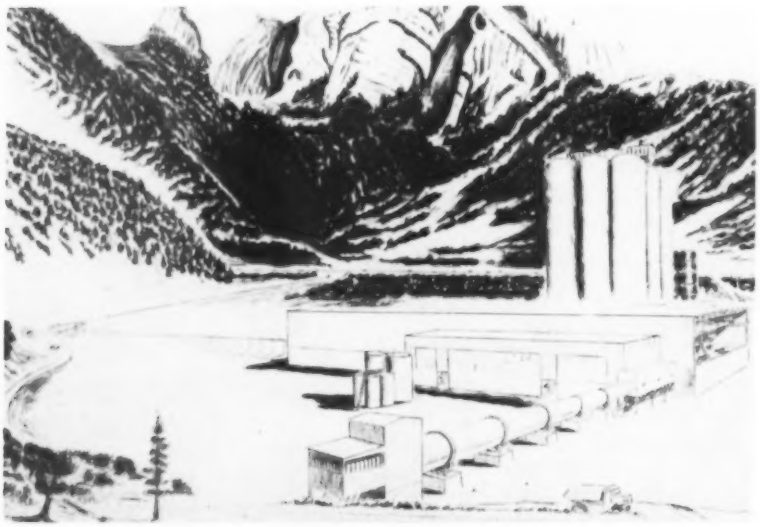
P. H. Townsend

Mr. Townsend has served Huron in various capacities relating to both its plants and ships. He joined the firm after World War I, became vice-president and general manager in 1939, in 1942 was named general supervisor of all manufacturing, sales, and accounting, and was elected to the board of directors in 1944. He attained the presidency in 1953.

Lehigh University Gets Grant For Lime-Soil Reaction Study

Lehigh University, Bethlehem, Pa., has been awarded a grant of $19,900 by the National Science Foundation for basic research in the pozzolanic reaction of common soil minerals. The project will be a basic study of the reaction between lime and minerals commonly found in soils.

Dr. Roy J. Leonard, assistant professor of civil engineering, will direct the study during the next two years. The research is aimed at explaining how certain soils stabilized with lime will behave under given field conditions of temperature and load changes; it will also undertake to determine the mechanism and nature of the reaction products of the lime-soil mineral reactions.



● This artist's rendition depicts the proposed $14,000,000 cement plant soon to go up at Redding, Calif., for Calaveras Cement Co. (See PIT and QUARRY, December, 1959, p. 24.) The site of the 1,500,000-bbl. plant is between the main line of the Southern Pacific Railroad and U.S. Highway 99 (shown at the foot of the mountains in this concept). The plant will incorporate advanced technology in production automation and dust collection. Estimated completion date is March, 1961.

Industrial Asphalt of Calif. To Absorb 41 Other Firms

Forty-one affiliated companies and Industrial Asphalt of California, Incorporated, will merge to form one surviving organization with the same corporate name. The new company will own and operate 32 asphalt mixing plants and related equipment strategically located in southern California.

The merger is reported to be one of California's largest with respect to the number of companies involved. Founded in 1941, Industrial Asphalt began with one plant, located in the San Fernando Valley. Home office of the newly merged corporation will be in Los Angeles.

1958 World Magnesite Output 5% Up—U.S. Major Producer

World production of crude magnesite in 1958 increased 5 percent above that of 1957, according to the U. S. Bureau of Mines. For the tenth consecutive year, the United States was the second-largest producer, at 492,982 short tons.

Magnesium compound imports decreased below those of 1957, and exports increased. Research in 1958 indicated improved methods for producing magnesium compounds. Basic refractories research programs and facilities were expanded, both in the United States and Europe.

Our Cover Picture

● Our cover picture this month depicts an obviously striking departure from the usual in aggregate plant sites. This installation is high, by a dam site (literally), in the Spanish Pyrenees. It was placed in operation last December to supply crushed stone materials for construction of the Salto de Aldeadavela dam on the Duero River. The plant will produce aggregates for use in more than 1,000,000 cu. yd. of concrete required in that project. Sized materials will be stored in the three bins at the bottom of the picture, and will be drawn from those units for transfer to the concrete batching plant seen in the center background below the two cement storage silos. The cover view is upstream toward the construction project, which when completed will provide much-needed power for a large area of northwestern Spain. Major processing components in the aggregate plant include a 24x60 jaw crusher supplied by Allis-Chalmers International, and 12 screens (6- by 16-ft.) furnished by Allis-Chalmers Great Britain, Ltd.

Medusa Launches First Stage Of Expansion-Modernization

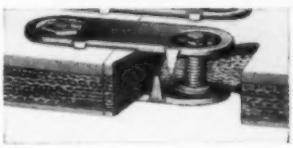
Additional cement production capacity and acquisition of limestone lands are the immediate aims of Medusa Portland Cement Company's $70,000,000 expansion-modernization plan. (See PIT AND QUARRY, October, 1959, p. 30.)

The first stage, which will cost $9,000,000, will include a 1,000,000-bbl. addition to the firm's plant at Dixon, Ill., to increase annual capacity there by about 40 percent. Options are being exercised on more than 2,000 acres of new limestone reserves in southern Illinois and southeastern Pennsylvania.

The program also will include installations for improved quality and cost reduction at Medusa plants in York, Pa., Toledo, Ohio, and Manitowoc, Wis.

ANOTHER FLEXCO SPLICE DOING A DEPENDABLE JOB AT *MATERIAL SERVICE CORP.*

Picture courtesy of Material Service Corp., Yard #15, Lockport, Ill.



Cutaway of a Flexco application showing compression plates, teeth and precision-made bolts and nuts.

Belt maintenance crews like to work with Flexco fasteners because they are easy to apply — joints last a long time — worn plates can be replaced quickly — ideal for repairing rips and tears.

PROTECT YOUR INVESTMENT IN CONVEYOR BELTS WITH FLEXCO . . . The quality fastener for all heavy-duty conveyor belt applications: SAND & GRAVEL, CRUSHED ROCK, COAL & METALS, CONSTRUCTION EQUIPMENT, etc.

Available in Steel, Monel, Stainless, Everdur. Also Promal top plates.

NEW **"25-PAK"**

"25-PAK" contains enough fasteners to join common belt widths.

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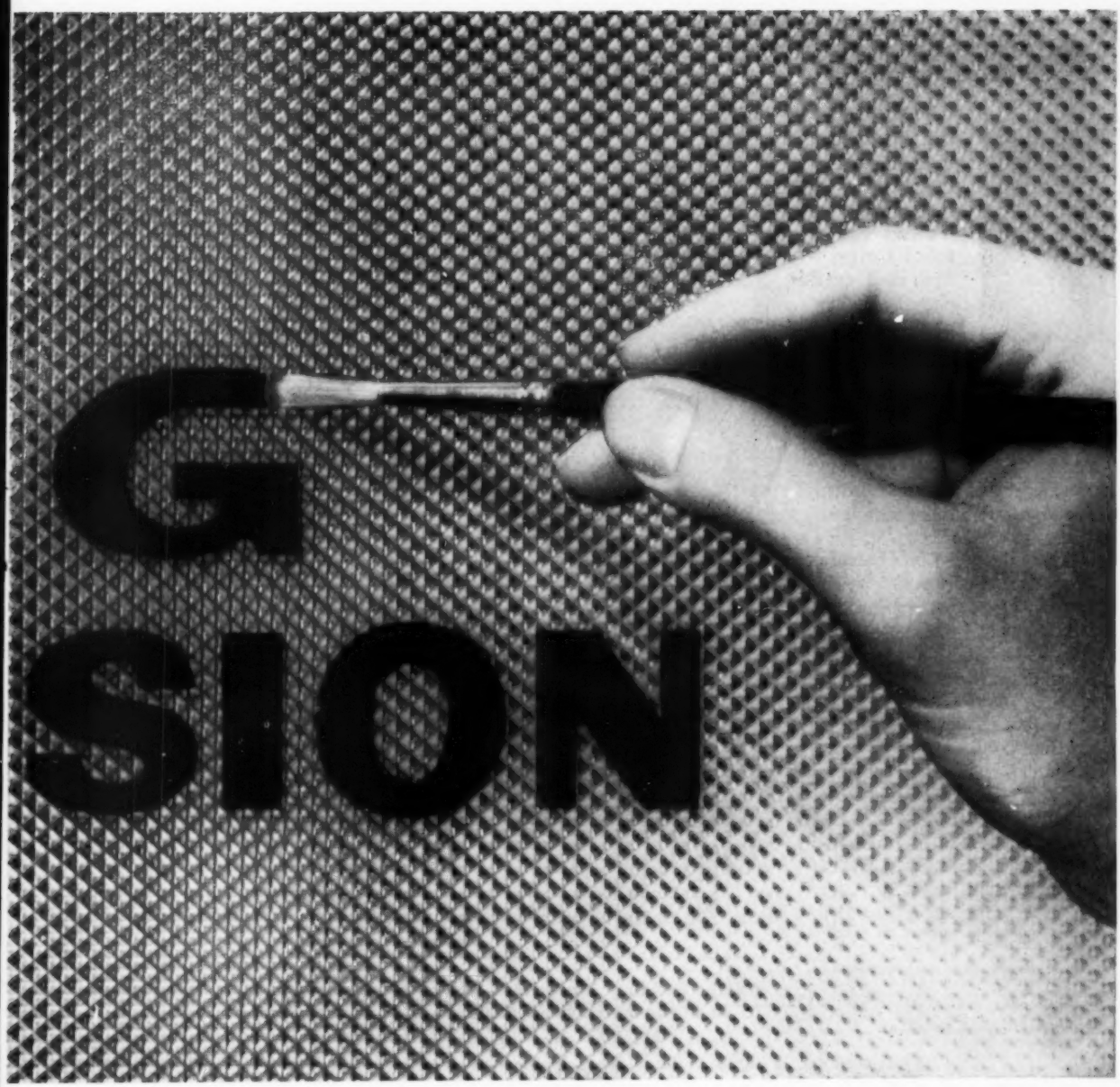
We shortened the name... and enlarged our services

It takes only a matter of minutes to change the name on an office door. But it took months of planning to organize St. Regis' all-out program to meet the ever-changing needs of our shipping bag customers. Now, with expanded facilities, we're prepared to serve you better than ever before.

The new St. Regis Bag Division was developed to provide you with four important services: *the right bag* for your product, *the best equipment* to fill it, *an engineering staff* to help reduce your over-all packaging costs, and, wherever possible, *new packaging systems* and methods.

It's so complete in every way, we call this new program *Packaging-In-Depth*.

It was made possible by consolidating St. Regis'



basic Multiwall organization with four highly-successful and respected paper and textile bag companies. We now offer a *complete* product line: multiwall, burlap, textile, mesh . . . whatever you need. We now have *13 manufacturing plants* for more efficient coverage of key areas throughout the country where industries depend on bags for shipping their products. In these areas, a complete staff of packaging engineers is ready to give you skilled service quickly.

Our research and development facilities are now available to all segments of the new Bag Division, to explore and perfect the most advanced, most efficient packaging methods.

One thing more. The people who *make* your bag are best qualified to supply the bag filling and closing machinery for your operation. St. Regis actually designs and produces the most complete line of packaging machinery in this field: more than 50 different models.

To sum up: more *diversified* services to offer . . . more *specialized* people to meet your needs. And though our men have *years* of experience in many fields, the spirit of St. Regis' new Bag Division is young and eager. We look forward to serving you soon.

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Fred P. Diener, Veteran Of Universal Atlas, Dies After 36-Year Service

F. P. Diener

Fred P. Diener, 61, director of research, Universal Atlas Cement Division of United States Steel Corporation, died unexpectedly on January 19 at his home in Eastchester, N.Y.

In his 36 years of association with Universal Atlas, Mr. Diener was responsible for a large part of the continuous program of the division's test and research activities for improving products and developing new ones. For many years, he served as member of Committee C-1 on Cement of the American Society for Testing Materials, and as a member of the General Technical Committee of the Portland Cement Association. He was also a member of the American Chemical Society, the American Concrete Institute, the Concrete Industry Board, the Highway Research Board of National Research Council, and other professional groups.

He joined Universal Atlas in 1924 as special chemist at Northampton, Pa. He served successively as assistant chief chemist, assistant general chemist, chemical engineer and director of research.

A view of the Taiwan Cement Corporation plant at Kaohsiung. Already the largest single source of cement on the island, the plant is being expanded by its owners. Increase in construction projects throughout the Far East is opening new markets for Taiwan's cement industry.

(Courtesy of Hamilton Wright)

60% Formosa Production Hike Paced by Taiwan Cement Co.

Taiwan (Formosan) industrial leaders are planning a 60 percent increase in cement production within a period of three years, which will make Taiwan one of the leading cement exporters in the Far East.

Five plant expansions are now under way and will be completed by 1962. Current cement production in existing facilities is at the level of 1,000,000 tons a year.

The Taiwan Cement Corporation, with five plants in operation, now plans to expand production at its Kaohsiung plant (see illustration), and will build another plant at Hualien on Formosa's eastern coast. Two other private cement companies are increasing production, and United States aid is currently helping a fourth producer, Asia Cement, to boost its output.

Cement production on the island has increased 100 percent in a period of only five years, to the present peak of 1,000,000 tons annually. Export sales alone account for nearly one-third, mostly to Southeast Asia.

Meade Sand & Gravel Co. Acquired by 3 Concerns

Meade Sand & Gravel Company, Midway, Wash., has been sold for $500,000 to the McLaughlin Company, Inc., Great Falls, Mont.; Midway Sand and Gravel Company; and B.E.C.K. Contractors—the latter two of Seattle.

New corporate officers will be Dick Egge, president, B.E.C.K. Co.; Joseph Romano, vice-president, Midway Sand and Gravel; and Cecil Sederholm, secretary-treasurer, McLaughlin, Inc.

HORACE VERNON GOODRICH, 79, vice-president of the Pacific Rock & Gravel Company, Los Angeles, died recently at his home in that city.

Plastic Building Materials To Be Made by Natl. Gypsum

National Gypsum Company will build a $400,000 addition to its Town of Tonawanda (N. Y.) Research Center, in anticipation of manufacturing new plastic building materials.

The 7,200-ft. addition will be a pilot plant for the development, testing, and limited manufacture of plastic building materials.

$400,000 Temporary Sand Plant Becomes Permanent Operation

The new $400,00 Shea-Kaiser-Morrison sand and separation plant at Redding, Calif., originally constructed as a temporary installation for fill for the Trinity dam tunnel, has become a permanent operation because of sufficient market demand.

The screening and crushing plant handles up to 400 t.p.h. and stone up to 36 in. in diameter. The scrubber used is reported 99.8 effective in dust control. Some of the product material is used in the 200-t.p.h. asphalt plant on the site.

Preliminary figures for American-Marietta Company indicate net sales of approximately $323,000,000 for the year ended November 30, 1959 —an increase of 29 percent over sales of $251,000,000 in 1958.

JOHN E. SHREVE and DAVID E. WALKER have been named sales representatives for the Dundee Cement Company in the firm's Chicago district office.

New John Deere 440 Crawler does more work "Single-Handed"!

The John Deere Crawler with Pilot Touch gives you an extra hand to *work* with, because *one* hand on *one* lever does all the driving—steer, stop, go, and reverse. The operator can give full attention to loader, winch, blade, or scarifier—producing more, and doing a better job in the bargain. Less effort is required—practically all clutch and brake footwork is eliminated.

Pilot-Touch control is an optional feature provided on both Diesel and gasoline "440" Crawlers. Any unit in the full line of John Deere Industrial Equipment is available on terms of the John Deere Credit Plan. See your dealer or write for the detailed information you need.

John Deere Industrial Division • Dept. 2506, Moline, Illinois

Drive crawler with left hand—control loader bucket with right—cut cycle time!

JOHN DEERE *"Specialists in Low-Cost Power with a Heavyweight Punch"*

E.S.C.S.I. Grant Set Up For Light Aggregate Study On Creep and Shrinkage

By action of the Expanded Shale, Clay and Slate Institute, a grant has been established for the comprehensive study of creep and shrinkage of expanded-shale lightweight concrete. The fund is under the administration of the National Bureau of Standards in Washington, D. C. This study will be conducted for a period of five to ten years on concretes made from aggregates produced by members of E.S.C.S.I.

Heading the study are D. E. Parsons, chief, Building Technology Division; David Watstein, chief, Structural Engineering Section; and Thomas W. Reichard, physicist, Structural Engineering Section.

Florida Phosphate Producers Pursue Anti-Pollution Policies

To date, more than $11,000,000 has been invested by nine phosphate producers in the Polk-East Hillsborough county area (Florida) in research, development, and installation of waste control systems to purify air and water released from their plants. These figures were announced by the Florida Phosphate Council, which noted that these companies also spend more than $2,500,000 a year to operate their purification facilities.

The water purification systems include large settling pools and neutralizing operations which permit the firms to re-use the same water repeatedly.

O. A. Johnson Named President Of Conveyor Equipment Makers

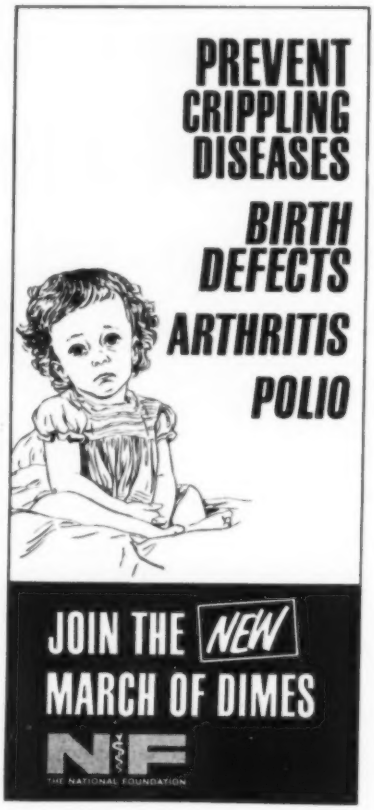
Orlan A. Johnson (president of Gifford-Wood Company, Hudson, N. Y.) has been elected president of the Conveyor Equipment Manufacturers Association, succeeding J. B. Nordholt Jr. (president of Webster Manufacturing, Inc., Tiffin, Ohio). R. C. Sollenberger was re-elected executive vice-president.

Other officers elected at the association's 26th annual meeting, held recently at Point Clear, Ala., are as follows: vice-president — E. H. Woodberry, manager, Industrial Products Division, Lamson Corporation, Syracuse, N. Y.; treasurer—H. A. Barber, president, Barber-Greene Company, Aurora, Ill.; secretary—G. H. Woodland, vice-president, marketing, Chain Belt Company, Milwaukee, Wis.

Major Expansion Planned For Natl. Gypsum at Rotan

A major expansion of the National Gypsum Company's plant at Rotan, Tex., will begin next spring. Completion is set for the following fall. It is expected that the expanded plant will have the capacity to produce enough gypsum wallboard, lath, plaster, and other gypsum building products for about 75,000 homes a year.

This plant has been modernized several times since it was acquired by purchase from the Universal Gypsum & Lime Company in 1935.



● Through the March of Dimes, science has helped to find the way to check the crippling effects of polio. Now the NEW March of Dimes will help science to stop crippling birth defects.

Phoenix Cement Company Sells Safety in Plant, Home To Implement Overall Plan

Safety consciousness is the general slogan at the recently opened Clarkdale, Ariz., plant of the Phoenix Cement Company (a division of American Cement Corporation). Thousands of dollars were spent on building safety into the plant, and company officials have implemented the design with safety program intended to "build in" employee and community safety consciousness.

Management enforces the standard safety-helmet regulations for operating personnel and visitors. It also requires that all employees serving in a supervisory capacity undergo the plant's 10-hour safety-training course and a 20-hour first aid course conducted by the Bureau of Mines. Weekly discussion meetings are held in each department on company time, with every employee serving at some time on a safety committee in his department. Monthly meetings of representatives from each department are held to compare notes on developments and evaluate recommendations from the individual department conclaves. Mass meetings of all plant employees are held every three or four months.

Safety-essay contests with large cash prize incentives are planned for teenagers in the community. Letters to employees' families, and leaflets in pay envelopes supplement the plant safety posters and contests. Company officials hope to develop one of the best safety records in its corporation, perhaps in the industry.

Virginia Firm Adds Equipment To Produce Aplite Mineral

Installation of equipment to modify existing ore processing facilities at the Hanover County, Va., operation of Metals and Minerals Division, Metal & Thermit Corporation, was recently begun. Substantial resources of aplite have been found in the ore body on the 800-acre site. Commercial quantities of the material will be available by June, 1960.

Aplite is one of a group of minerals used by the glass industry as a source of alumina for the production of colored and flint container glass and window glass.

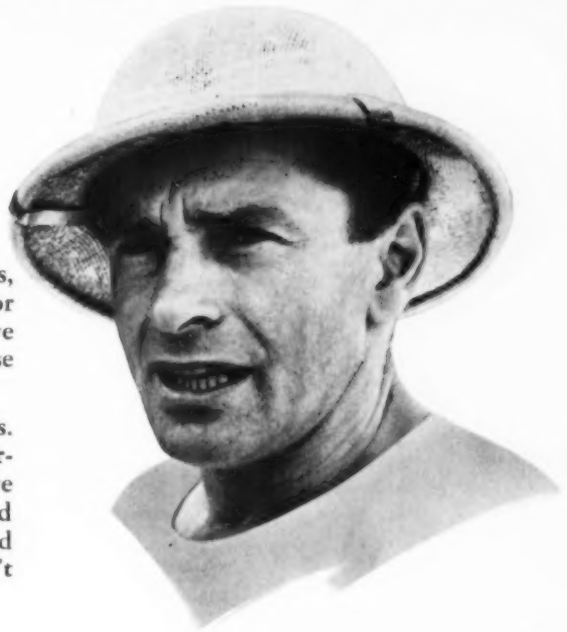
Enter 33 on card, page 169 →

4 who bought Ford Tractors . . . and *WHY*

"Price"

says Jackson

president of "Pools of Distinction,"
Jacksonville Beach, Florida.



"We style and custom build swimming pools of all sizes, 15′ x 30′ and up," says Mr. Jackson. "Our Ford tractor digs and shapes the cavity with a backhoe. Then we use the loader to stack earth around the walls and raise the pool level.

"We figure Ford saves us over $100 a pool," he adds. "We're very pleased with our dollar savings in operation and maintenance costs. But these were benefits we learned about by experience. What attracted me to Ford in the first place was price. Comparing features and work capacity with others on the market, I couldn't find anything else to match Ford."

PRICE? THESE ARE THE FACTS WITH FORD*

Ford Workmaster Tractors—$330 Under Average

(Comparison power range—34 to 47 engine HP)

Ford Model 621 tractor's retail list price is $63 less than its nearest competitor among 10 other utility tractors, and $330 less than the average price for all 10—seven of them having less than Ford's 45 engine HP. Ford's price of $48 per engine HP is $5 less than its nearest competitor, and $13 less than the average for all 10.

Ford Powermaster Tractors—$1,138 Under Average

(Comparison power range—51 to 72.5 engine HP)

Ford Model 821 tractor's retail list price is $667 less than its nearest competitor among five other utility tractors, and $1,138 less than the average price for all five. Ford's price of $39 for each of its 62.5 engine HP is $12 less than the No. 2 tractor, and $19 per HP less than the average for all five.

Ford Diesel Tractors—$409 Under Average

Diesel engines are a factory-installed option for all series of Ford tractors. In each power class, Ford costs less than all comparably equipped competitors. Each Ford diesel option costs only $420 more than the same Ford tractor in a gasoline model. Among the nine other more popular diesel tractors, the average mark-up for diesel as compared to gasoline models is $829. Ford's mark-up is $409 less than the average for these other diesels, and $130 less than its nearest competitor.

Ford Industrial Tractors—$474 Under Average

(Comparison power range—51 to 72.5 engine HP)

Ford Model 1821 tractor's retail list price is almost the same as one other industrial tractor in its power class ($3 less, to be exact), but it is $474 less than the average price of the five others in this class. Ford's price of $49 per engine HP is a dollar less than the No. 2 tractor and $8 less than the average for all five. Perhaps even more important, when all of these units are equipped with loaders, Ford is first in breakaway, a close second in rated lift capacity and the leader by a big margin in overall productivity. Ford moved 13 tons of material an hour more than its nearest tested competitor!

*All comparisons are based on tractors equipped comparably to the Ford models cited. Retail list prices are F. O. B. factory and will result, of course, in variations of delivery price according to point of purchase. Comparisons are based on the most recent published data held by Ford at the time of printing, and are believed to be an accurate reflection of suggested retail list prices before addition of shipping charges, state taxes, etc.

4 who bought Ford Tractors . . . and *WHY*

"Dependability"

says *John a Behnken*

president of Behnken Coal and Materials Company of New Athens, Illinois.

"One operator with Ford loads out 200 tons of limestone in 8 hours," Mr. Behnken says. "That's a $600 payload and twice the amount four men used to load in four days. Ford loading efficiency saves coal customers $1.40 a ton. And we gain at least 50c a ton price advantage on quarry materials because fast loading lets us stockpile.

"But probably the biggest thing to me—the reason I'll always buy Fords—is dependability. I've got one tractor 14 years old and another one 10 years old. They've averaged 25,000 tons of rock, sand and limestone, and 6,000 yards of dirt a year ever since.

"Both have been in constant service and with just about everybody among our 30 people operating them at one time or another," he continues. "Yet we've never had a major repair and never had a parts replacement involving either engine!"

DEPENDABILITY? THESE ARE THE FACTS WITH FORD

Over Two Million Ford Tractors

In manufacturing as in most other fields, there's no substitute for experience to produce machines giving the years of dependable performance described by Mr. Behnken and thousands of other Ford tractor owners. Ford has more tractor experience than any other company, today is well on the way toward its three-millionth tractor.

World's First Mass-Produced Tractor

In 1917 the world saw its first Fordson. During the next decade it saw more than 700,000 of them—some three-fourths of all U.S. tractor production. In 1939 Ford introduced built-in hydraulic systems with its model 9N Ford tractor. Sixteen years later Ford produced its one-millionth tractor with revolutionary three-point hitch and hydraulic system.

Birth of the "Red Tigers"

In 1952 Ford produced the first of the "Red Tiger" engines which still today are such a vital part of Ford tractor dependability, Since that time—more than three-quarter million engines ago – they've been refined, given more power, improved in many ways. But each has added to the Ford fund of experience which goes into the production of today's—and tomorrow's—Ford tractors.

Only Tractor Maker with Auto Experience

Ford is the only member of the tractor field with ready access to the production experience, the depth of research and the foresighted engineering of the auto industry. Ford's new and exclusive Select-O-Speed transmission, for instance, drew heavily on the experience gained with planetary gearsets in many millions of Ford autos. Ford Tractor and Implement people are quick to adapt all proven processes and economies to their own production . . . benefits which loom big among the many reasons for Ford's consistently high quality, Ford's traditional low cost.

4 who bought Ford Tractors . . . and *WHY*

4 who bought Ford Tractors . . . and *WHY*

"Versatility"

says *Carroll Blackden*

president of Krete Kraft Concrete Products Company of North Hampton, New Hampshire.

"Our Ford tractor and loader paid for itself in less than a year," says Mr. Blackden, whose company is the largest producer of concrete septic tanks in New England. "It enabled us to handle easily a 20% increase in production.

"Considering the constant heavy use this Ford tractor gets, it is a real tribute to its rugged design that our maintenance costs have been so very small. But I believe the biggest Ford feature is versatility. Our tractor works about half-time loading aggregate and pouring cement, about half-time storing and truck-loading distribution boxes, tank covers, etc.

"In addition," Mr. Blackden says, "the unit is used for occasional work in home construction, and for snow removal at the plant about 10 days a year. It's the steadiest worker on the job and the most versatile piece of equipment we have."

VERSATILITY? THESE ARE THE FACTS WITH FORD

Wide Range of Tractors

Ford offers a line of tractors with power and equipment for almost any materials handling or grounds maintenance job. Six different Workmasters, five Powermasters and five Ford Industrial tractors—all with diesel engine options which in effect double the selection to 32 models. They range from Special Utility models—for drawbar operations and work not needing hydraulic systems—up through fully equipped tractors with the new Select-O-Speed transmission and two-speed power take-off. Ford also offers Utility and All Purpose models of the big Fordson Power Major Diesel, the new Fordson Dexta Diesel, and both Standard and High Clearance models of the new Ford Offset tractor for nurserymen and landscapers. With Ford you choose your weight, your power, your tractor equipment and your work capacity . . . select exactly the right tractor for *your* job.

Wide Range of Basic Attachments

You'll find exactly the right Ford attachment for your job, too. Loaders with 1,000 to 2,500-lb. rated capacity; 10 ft., 12 ft. and 14 ft. backhoes; 6′ or 7′ front and rear blades; 65″ to 80″ rollover and box type scrapers; tiller rakes; 60″ and 100″ rotary cutters; 6′ and 7′ cutter bar mowers; 6′ and 8′ lime and fertilizer spreaders; cordwood saws, posthole diggers and many other attachments designed to save time, men and money on dozens of jobs.

And an Ever-Growing List of Specialized Equipment

Your Ford Tractor and Equipment dealer also sells many other attachments for Ford tractors. Brooms, winches, fork lifts, air compressors, side booms, sprayers, aerating tools, rollers, trenchers, pumps, reel mowers, compactors, portable welders . . . the list seems almost endless, and in almost every case fulfills a real need in replacing costly hand labor. Just give Ford a try. You'll soon find it's the busiest worker on your job.

4 who bought Ford Tractors . . . and *WHY*

"Service"

says *Carmen Oliver*

partner, Oliver Bros. Landscaping of Tonawanda, New York.

"We take over landscaping jobs two or three inches from finished grade," Mr. Oliver says, "and spread top soil, rough grade, backfill foundations, finish grade, seed and fertilize. Three Fords with loaders, blades and other attachments are operated 10 to 12 hours a day, six days a week.

"Ford has cut our operating costs at least 50%," he adds, "and in 24 years of operation—the combined total of the four Fords we've owned—we've never yet had any significant down time.

"We practice our own preventative maintenance and dealer service is seldom needed. When we *do* need our dealer, though, he always comes through for us. The service is excellent and you can understand how important that is to us when you watch how much Fords are a part of our day-to-day operation. We just couldn't afford any major down time."

SERVICE? THESE ARE THE FACTS WITH FORD

Wherever You Are, Ford's Not Far

In every state, in almost every county in the United States, there's a dealer, distributor or manufacturing plant for the Tractor and Implement Division of Ford Motor Company. You're only a few hours, at most, from dealer parts stocks . . . only a phone call away from the even bigger stocks held in reserve by Ford's 29 Distributors and Sales Districts.

Ford Reputation on the Line

When you buy Ford tractors and equipment, you also receive the "job security" of an authorized Ford Tractor dealer's parts and service warranty. You're also buying the future bonus of Ford's excellent trade-in values.

See Your Dealer Soon

These are just a few of the many reasons why Fords are replaced with Fords, and why more companies add Ford to their equipment every week. Owner satisfaction stems not just from the product, but to a large extent from the man who sells it and keeps it working. Have you talked to your Ford Tractor and Equipment dealer lately? He's selling the most basic job needs—economy, dependability, versatility and service. He's selling satisfaction. Get yours right away!

TRACTOR AND IMPLEMENT DIVISION • FORD MOTOR COMPANY • BIRMINGHAM, MICHIGAN

Ford
INDUSTRIAL TRACTORS AND EQUIPMENT

Trailer Fleet of 20 Units Used by Phoenix Cement For 3 Million-Bbl. Contract

A fleet of 20 tractor-trailers especially built for the job has started a 4-year transport schedule to carry some 3,000,000 bbl. of cement from the Phoenix Cement Company's plant at Clarkdale, Ariz., to Glen Canyon Dam. The Belyea Truck Company, Los Angeles, has the hauling contract.

These new delivery units consist of Autocar diesel tractors, each pulling a pair of Fruehauf bulk-cement hopper trailers. In fulfilling the contract, the rigs will travel about 375 miles per round trip, or about 8,500,000 miles in all. They will operate on a 'round-the-clock schedule until late in 1964 or early in 1965.

The trailers were designed to fit the twin loading spouts at the cement plant silos, permitting the double trailers to be loaded simultaneously. Hopper bottoms of the trailers have interchangeable liners.

The Belyea firm recently erected a new maintenance terminal building at Cottonwood, Ariz., a few miles from the Clarkdale plant, properly to service the fleet. This company, which has 300 employees, is well known throughout the West, particularly for equipment suitable for hauling exceptionally heavy, long, or wide loads. Belyea has already transported over 8,000 tons of machinery and materials from the railhead at Flagstaff, Ariz., to Glen Canyon Dam, including all the steel for the bridge which spans the gorge at the dam site.

One of the 20 new tractor-trailers carrying cement to Glen Canyon Dam.

Material Service Now Division Of General Dynamics Corp.

Shareholders of Material Service Corporation and General Dynamics Corporation have approved the merger of the two firms, culminating more than a year of on-and-off negotiations (see PIT AND QUARRY, December, 1958—p. 26; January, 1959—p. 176; August, 1959—p. 23). Approval was given at separate meetings in Chicago and Dover, Del., and the title of the Chicago firm is now Material Service Division of General Dynamics Corp.

The merger, to be effected through a stock exchange, makes Material Service the largest stockholder in the growth-minded New York billion-dollar-plus corporation. The price paid for Material Service—over $100 million—is the highest ever paid to purchase a Chicago firm. Both concerns have had startling growth rates in sales and earnings since World War II. Shared research is expected to benefit both companies.

Colonel Henry Crown, chairman of Material Service, and Hugo A. Anderson, a director, will be added to the Dynamics board of directors this month. No changes in operating policies are scheduled.

Lime Sales in October, 1959

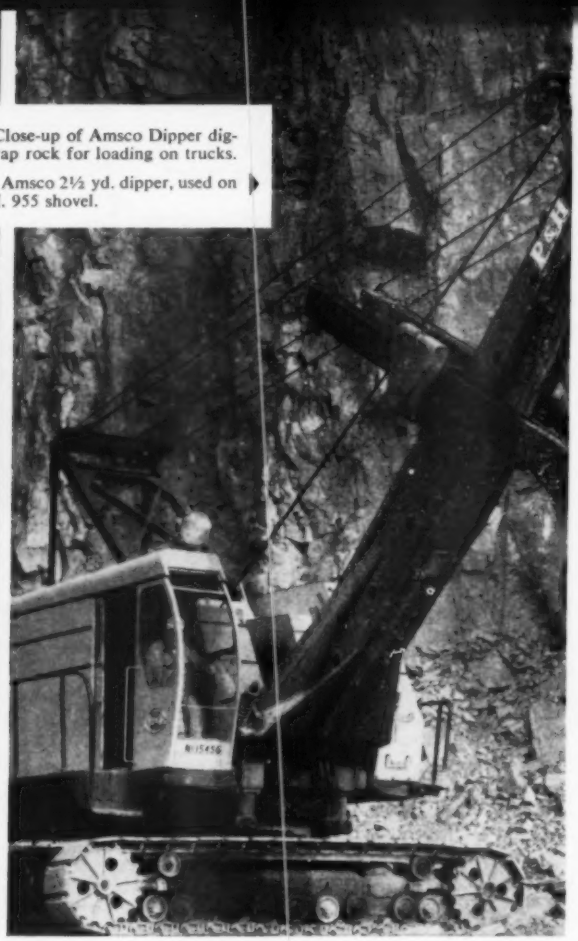
Domestic sales of open-market lime in October, 1959—681,931 short tons—decreased from the previous month's output, according to reports by producers to the United States Bureau of Mines.

Refractory lime increased whereas a decrease was noted in agricultural, construction, and chemical and other industrial lime.

Lime Sold by Producers in the United States, in Specified Periods of 1958-59, by Types and Major Uses in Short Tons

	September	October		January-October	
	1959	1959	1958	1959	1958
By types:					
Quicklime	485,860	495,778	598,679	5,759,612	4,734,176
Hydrated lime	197,935	186,153	174,496	1,736,756	1,590,564
Total	683,795	681,931	773,175	7,496,368	6,324,740
By uses:					
Agricultural:					
Quicklime	5,685	4,187	4,953	56,994	46,380
Hydrated lime	7,904	6,022	8,040	94,449	106,007
Total	13,589	10,209	12,993	151,443	152,387
Construction:					
Quicklime	29,938	29,626	12,242	145,786	111,450
Hydrated lime	93,185	88,734	86,417	841,259	776,229
Total	123,123	118,360	98,659	987,045	887,679
Chemical and other industrial:					
Quicklime	402,773	402,499	376,027	4,030,341	3,234,879
Hydrated lime	96,846	91,397	80,039	801,048	708,328
Total	499,619	493,896	456,066	4,831,389	3,943,207
Refractory (dead-burned dolomite)	47,464	59,466	205,457	1,526,491	1,341,467

[1]Also includes a quantity of captive tonnage. The monthly convass excludes the output of plants producing less the 10,000 tons a year.

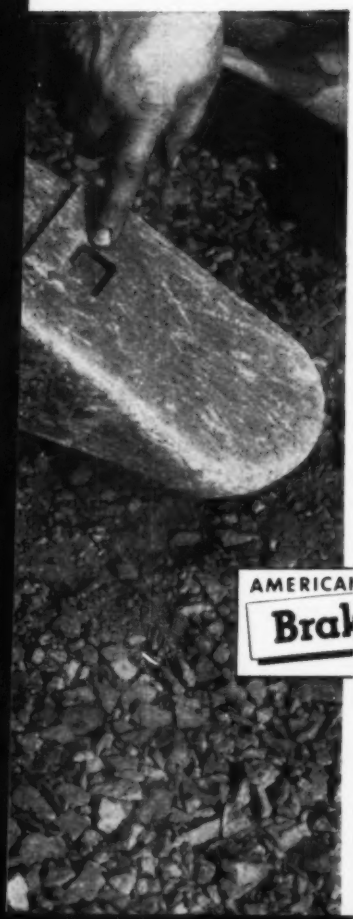


Left: Close-up of Amsco Dipper digging trap rock for loading on trucks.

Right: Amsco 2½ yd. dipper, used on P. & H. 955 shovel.

Left: Amsco 2½ yd. dipper equipped with Amsco Simplex 2-Part Teeth, used for rock digging and loading at quarry.

Right: Special pin lock assures positive locking of reversible tip on Amsco Simplex 2-Part Teeth.



More proof that...

AMSCO HELPS YOU MOVE MORE TONS PER DOLLAR

Read about the actual experience of a large New England quarry with Amsco Dippers and Simplex 2-Part Teeth*

"WE HAVEN'T WORN OUT AN AMSCO DIPPER IN 5 YEARS"

This, in the words of the quarry superintendent, sums up his experience with Amsco Manganese Steel Dippers. It's rugged work, all in rock, as you see from the pictures at the left. Shovel and dipper are used to load trap rock onto trucks for transportation to the crushing plant.

The Amsco Dipper was installed because the superintendent had used them before, and knew their reputation for long life under tough digging conditions. Experience is proving him right . . . again.

SIMPLEX TEETH HANDLE 25,000 YDS. OF ROCK BEFORE REPLACEMENT

At this same quarry, Amsco Simplex 2-Part Teeth are giving 120 hours' service... handling 25,000 to 30,000 yards of rock... before replacement is necessary. That's considerably longer service than has been obtained from competitive 2-part teeth, the quarry superintendent states.

Not only is the wear-life of these teeth exceptional, but operators like the ease of replacement, and the fact that the tips stay on without trouble.

For further information on Amsco Dippers or Simplex 2-Part Teeth, see your power shovel equipment dealer, or write to Amsco for technical bulletins showing sizes, types and application data. *Patent No. 2,904,908

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Dela. • Oakland, California • St. Louis
In Canada: Joliette Steel and Manitoba Steel Foundry Divisions

Enter 38 on card, page 169

Convention Expenses Ruled Still Deductible— If You Prove It's Business

According to Rev. Rul. 59-316, the Internal Revenue Service has reaffirmed the practice of listing costs of convention attendance as business expense deductions. But the ruling emphasized the need for proof of a "business interest."

Convention (or meeting) expenses are *not* deductible, according to I.R.S., solely because a person attends a meeting as an elected or appointed delegate. He may still be required to show that his attendance is "benefiting or advancing the interests of his trade or business."

$775,000 Filtering System Scheduled by Universal Atlas

Final approval was recently given by directors of Universal Atlas Cement Company (a U. S. Steel Company subsidiary) for a $775,000 fiber glass bag dust-collecting system to be installed at the firm's Fairborn, Ohio, plant. It will augment the present mechanical filters, and is scheduled to be in operation late in 1960. Efficiency is expected to increase from the present 92 to 96 percent to nearly an ultimate 100 percent.

The new facility will contain eight sections of 54 bags each. The existing twin stacks—now 180 ft. high—will be lowered to 60 ft.

Two kilns will be closed down initially to permit the installation; when this first stage has been completed, the other two kilns will be temporarily retired from service.

Thanks to Red Cross, little Debbie slept—and lived—through a tornado

After the tornado ... safe and sound

The tornado had shocked all St. Louis with the tragic toll of disaster.

. . . Somewhere under the ruins of her family's home was little Debbie. Red Cross found her—fast asleep—and cared for her until she could be reunited with her family.

Wherever disaster strikes, Red Cross is on the job, helping to make good things happen. This year—*give* all you can.

Good things happen when you give ✚

Engineering is under the direction of the American Bridge Company, also a division of the U. S. Steel Corporation.

The Hydraulic Company recently began production of masonry mortar sand from a floodplain deposit located near Charlottesville, Va.

Trade Organization Formed By Equipment Makers To Combat Air Pollution

The Industrial Gas Cleaning Institute, Inc., a new trade organization, has been formed by representatives of leading manufacturers of gas cleaning equipment. John T. Doyl. The Thermix Corp., Greenwich. Conn., has been elected as the first president of the non-profit group.

Other officers elected at the organizational meeting were L. L. Andrus (Wheelabrator Corp., Mishawaka. Ind.), vice-president; and John G. Liskow (American Air Filter Co.. Louisville, Ky.), treasurer and temporary secretary.

I.G.C.I. was formed to promote the interests of manufacturers of industrial gas cleaning equipment; to provide for improved trade practices among its members; to perfect standards of design and operation of gas cleaning equipment; and to collect and disseminate lawful information regarding the applications of their products to industrial gas cleaning.

Predict Big Potash Deposits To Boost Canada to Forefront

A recent report by J. B. Cummings, a potash expert with Potash Company of America and its Canada subsidiary, Potash Company of America Ltd., forecasts the rapid rise of Canada as one of the world's main potash sources. The firm's new plant at Saskatoon, Sask., which began operations last year, is the first and presently the only potash producer in Canada.

First shipments were made recently to the United States; and shipment to Japan (which must import practically all of its potash) began last July.

Potash has been found in the Canadian salt basin, an area about 1,000 miles long and about 150 miles wide, extending approximately from the northern border of Alberta southeasterly into parts of Montana and North Dakota.

H. R. MANTLE has been named assistant to the president of Dravo Corporation. He formerly was assistant to the executive vice-president.

DREDGE MORE DOLLARS WITH THIS SUCTION HOSE

Our company devotes its entire time to the exclusive manufacture and sale of Suction Hose and Dredge Sleeves for the Dredging Industry. Our specialization pays off for you in longer wearing materials combined with the highest quality craftsmanship. You too can BENEFIT by lowering your replacement hose and sleeve costs. Your requirements and needs are our specialty.

HYDRO-DREDGE ACCESSORY CO. 9 NORTH JEFFERSON STREET CHICAGO 6, ILLINOIS

Enter 40 on card, page 169

Two J-M Corp. Divisions Handle Perlite Processing In Realignment Move

Johns-Manville Corporation recently divided its perlite mining, milling, and manufacturing activities between two of the company's ten operating divisions, each of which is responsible for its own production, sales, and profits. (The properties were acquired September, 1959, from the former F. E. Schundler & Co., Inc., of Joliet, Ill.)

The J-M Celite Division will operate the perlite ore deposit and mill (located about 70 miles north of Santa Fe at No Agua) in New Mexico; the facilities for storage, blending and loading perlite at Antonito, Colo.; and one of two perlite plants at Joliet, where nonmetallic minerals such as perlite, limestone, and various clays are expanded, and screened or ground. This is the J-M Division at Lompoc, Calif., that produces diatomite filter aids for industry.

The J-M Building Products Division has been assigned responsibility for the former Schundler Rockdale plant near Joliet, where Fesco board —a noncombustible roof insulation containing perlite—is produced.

These properties are now owned by the subsidiary, Johns-Manville Perlite Corp.

Credit Lists Being Readied By Dun & Bradstreet Staff

Dun & Bradstreet, Inc., through its network of offices, is mailing its annual request for financial statements to virtually all the business concerns in the United States and Canada which seek or grant commercial credit. These requests will go to 3,000,000 manufacturers, wholesalers, producers, and retailers in more than 50,000 cities and towns listed in the Dun & Bradstreet Reference Book.

Dun & Bradstreet also offers a new 40-page small business handbook — *How to Build Profits by Controlling Costs.* This is a practical guide which shows how to control the costs of doing business through explanation and analysis of business figures. Single copies of the booklet are available (free) from the Public Relations and Advertising Department, Dun & Bradstreet, Inc., 99 Church Street, New York 8, N. Y.

WASH WATER goes UP . . .

slimes cannot remix with sands

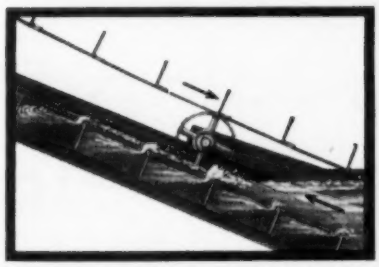
. . . in the "OVERDRAIN" Classifier

The "Overdrain" Classifier is a completely new device in the field of mechanical wet classifiers. The belt, with lifting flights attached beneath, moves upwardly out of the sand bed between two stationary side shrouds—creating the effect of a series of moving, closed, washing compartments.

The only outlet from these compartments is via holes in the belt above. Surplus liquid and slimes discharge through these "overdrain" holes without mixing with the oncoming sands. The end result is an extremely clean sand discharge, excellent de-sliming—making the "Overdrain" Classifier an ideal washing device.

Acid-proof construction available.

See a working model of the "Overdrain" on display in the Hardinge Booth at the NSGA-NRMCA-NCSA exhibits, this month in Chicago.



Section through "Overdrain" Classifier showing upward-moving, closed, washing compartments.

Unretouched photograph of "Overdrain" action above the belt—water and slimes discharging upwardly.

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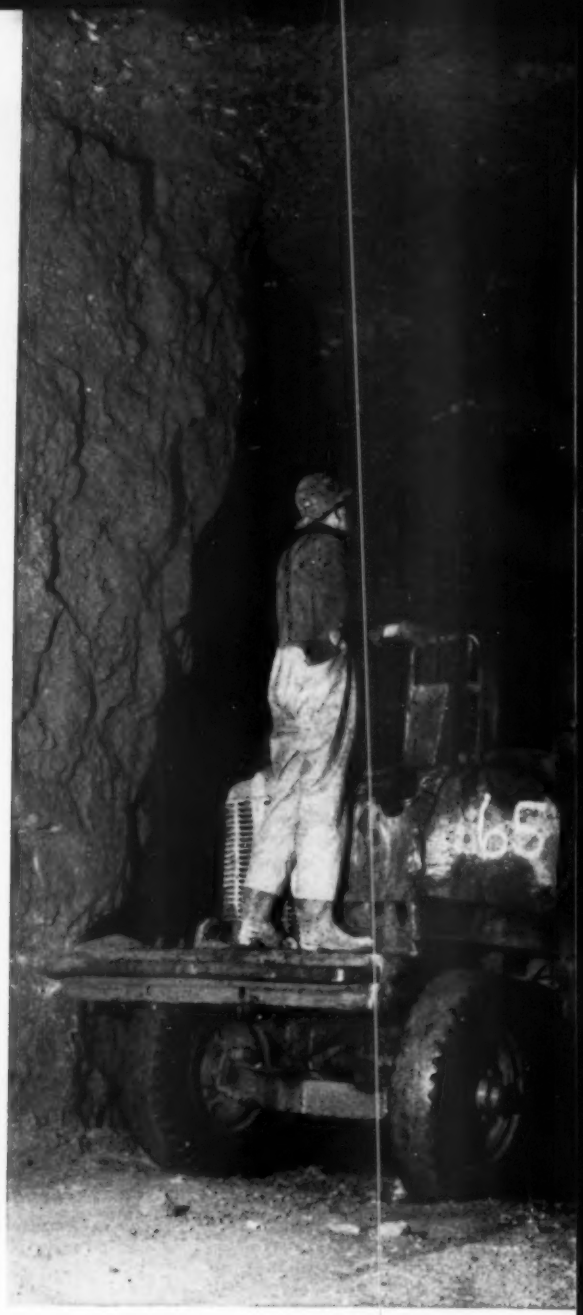

Average load of 8 tons takes a Michigan 2 to 4 minutes. Rock here averages 3% zinc (crushed and concentrated for shipment to smelting plants), 3% iron, 94% limestone (crushed and sold to railroads and contractors).

Tires replace tracks for underground zinc-ore loading at Eagle-Picher mine

Production boosted 40%, repairs cut in half

In the sprawling, honeycombed caverns of a zinc mine 300 feet below ground, two rubber-tired Michigan Tractor Shovels are loading out 40% more ore than the crawler loaders they replaced—proving mobility is an asset anywhere—even below the earth's surface.

Before the rubber-tired Model 175A Michigans were put to work in this mine near Galena, Illinois (one on the day shift; the other, at night), owner Eagle-Picher Company was using crawler loaders. Two things caused the switch to rubber. One, repairs on each crawler cost more than half *each year* of the total price of the crawler new. Two, lack of loader mobility was wasting time for all dependent equipment.

Since everything that goes in or out of the mine must travel through either of two mine shafts, it costs Eagle-Picher $500 or so just to lower, reassemble, and try out a new machine. But in this case, the company made up their "investment" in just a couple of shifts.

Save 60 minutes travel time

According to mine superintendent, Ed Houy—an 11-year veteran with Eagle-Picher—"First of all, an hour of waste time was eliminated every day. It used to take the crawlers 20 minutes to creep a mile or so from our central service area to the work site. And 20 minutes at the end of the day to come back again. The Michigans make the trip, either way, in five minutes. So 15 minutes a trip, 30 minutes total, are saved on each of our two shifts.

Triple output on scattered loading

"Mobility also pays off in certain areas of the mine where our 8-ton trucks can't be spotted right next to the shot rock," Mr. Houy continues. "Here, loaders must carry material as much as 100 ft. The rubber-shod machines often do three times the work of crawlers in these applications. The same advantage holds true when loads must be taken in succession from different headings in order to get the desired 3% blend of zinc for processing."

One Michigan keeps 5 trucks busy

Michigan output is high on straight loading too, according to general superintendent Harold Haman. "With trucks on average one-way haul distance to the crusher of about one mile," he says, "one Michigan loads out as much as 100 tons per hour. It alone keeps five 8-ton trucks busy. Each 8 ton load takes a Michigan three passes, two to four minutes (depending upon the digging and terrain). A typical day yields 1,400 tons of rock. Previously, with crawler loading, our top output was 1,000 tons. The daily increase, 40%."

Maintenance costs 50% lower

According to Robert Haffner, manager of Eagle-Picher's Illinois-Wisconsin operations, "Michigans not only load out more rock than the crawlers, but they also have proved cheaper to operate and maintain. Cost of maintenance per ton loaded *is about half*. Majority of the few repair jobs we've had have taken less than four hours to complete. And the shot rock, so rough that steel tracks and track frames required numerous overhauls, have been comparatively easy on tires. Recapping is needed only every 1,000 hours or so.

Ownership of 4 Michigans proves satisfaction

"Before Eagle-Picher settled on Michigans, we tried other machines," continues Mr. Haffner. "After careful consideration, we decided Michigans had the sturdiness, mobility, and productive capacity we needed. We now do all loading here in Galena—and at our Wis. mine—with Michigans. Four of them. So you can see how much we like them!"

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Construction Machinery Division

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Michigan Dozer operator has excellent view of blade.

High-speed Michigan Dozer expands

Nevada firm reduces handling costs 25%

Nacon Company, Inc is a Las Vegas firm that *doesn't* take chances when buying equipment. "Gambling belongs in the casinos!" says Tom Stewart, president of Nacon. "Before *we* lay out $50,000 or so for any big dozer, we *demand* on-the-job demonstrations.

"Our latest demonstration really proved profitable. In the hopes of boosting crusher-feed production, we tried a rubber-tired Michigan Dozer. The output of this rig really surprised us. Tests showed the 375 hp Model 380 could push enough material to our crusher to produce 400 tons of spec stone per hour—*even at distances up to 400 feet*. No competitively-priced rig came close to this production. We talked it over with our Michigan Distributor, Graid Equipment Company . . . and bought!"

The Michigan's first job was on a 9-mile excavating-grading-structures section of new four-lane blacktop Federal Interstate Highway near Las Vegas. Here, Nacon's contract called for several hundred thousand tons of roadway base and sub-base gravel (3,250 lb/yd) in three grades—select bankrun, #1 and #2 stone. Michigan's share was to dig out and push all this material to the crusher. It did . . . at an *average* work speed of 3 to 7 mph!

Production up 20 to 30%

Output averaged 400 tons per hour . . . 20 to 30% higher than Nacon's estimates with other machines . . . at a per-ton cost "about 25% lower." And since the high-speed Michigan could economically work longer distances, Nacon didn't have to move the crusher as often as with crawler-feeding. One set-up handles as much as 315,000 tons.

Bud Jacobsen, operator of the Model 380, likes the Michigan for more reasons than high production. "For one thing, it's easier riding," says Bud. "Tires absorb bumps and ruts so you can work faster on rough going. Second, you sit higher . . . have a better view of blade and of ledge and hopper edges. Third, Michigan handles easier . . . you change speeds and direction simply by moving little hydraulic levers *and without foot-clutching*. Its ease of handling, plus greater speed, adds up to *greater production than any crawler at any distance over 50 ft!*"

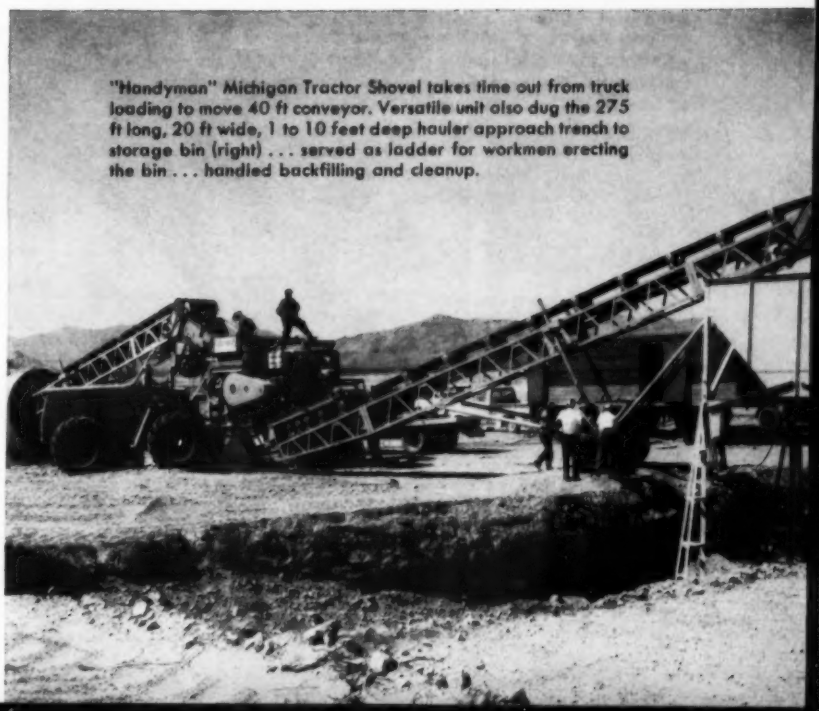
Michigan Tractor Shovel loads 20 yd trucks in 2½ minutes

But the Model 380 Dozer isn't the only Michigan drawing praise around Nacon's crushing set-up. A 2¼ yd Model 175A Tractor Shovel is attracting attention as

practical crusher feed distance to 400′

it handles stockpile loading. This unit heaps a typical 20 ton truck in only 5 passes, 2½ minutes . . . a typical 20 ton bottom-dump hauler in 4 passes, 2 minutes.

Output like this, day in and day out, speaks well of Nacon's job planning . . . also proves Michigans have what it takes to speed dozing and loading. See for yourself! Pick the rubber-tired Michigan Dozer you want to see, 162, 262, 375, or 600 hp . . . or the Michigan Tractor Shovel, 16 cubic feet to 6 cubic yards (standard SAE-rated capacity) . . . then ask your Michigan Distributor for a demonstration.



"Handyman" Michigan Tractor Shovel takes time out from truck loading to move 40 ft conveyor. Versatile unit also dug the 275 ft long, 20 ft wide, 1 to 10 feet deep hauler approach trench to storage bin (right) . . . served as ladder for workmen erecting the bin . . . handled backfilling and cleanup.

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY
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Construction Put in Place Drops at End of 1959—But Year Hits New Record

The value of new construction put in place in November, 1959, amounted to $4,400,000,000, according to preliminary estimates of the U.S. Department of Commerce. This was 9 percent less than in October, 1959 (slightly greater than the normal seasonal change), and 1 percent less than in November, 1959.

The value for December, 1959, amounted to $4,100,000,000, according to the preliminary estimate. This was 7 percent less than in November, 1959 (less than the normal seasonal change), but at the same level as in December, 1958.

Items (Nov.): public construction, valued at $1,100,000,000, dropped 20 percent below October, 1959, and 19 percent below November, 1958, more than the seasonal drop. Highway construction expenditures declined more than seasonally to about $370 million (down 35 percent). The aggregate of all other types of public construction showed the normal seasonal decline. Private construction was valued at $3,300,000,000—5 percent below October, 1959, but 6 percent above November, 1958, a decrease more than normal for this period. New private residential building expenditures declined more than seasonally to $1,900,000,000—6 percent under October, 1959, but up 7 percent from November, 1958.

Items (Dec.): public construction, valued at $1,000,000,000 showed less than a normal seasonal drop from November, 1959, and was 17 percent under December, 1958. New private residential building expenditures declined less than seasonally to $1,800,000,000—8 percent under November, 1959, but 5 percent above December, 1958. Total new private construction amounted to $3,100,000,000 as compared to $3,300,000,000 in November, 1959—a smaller than seasonal decline for this period, and a gain of 7 percent over December, 1958.

Value for calendar year 1959—The total value of new construction put in place was $54,300,000,000, a record high level, despite the effects of the steel strike; it was 11 percent above the $48,900,000,000 figure in 1958. **Items:** expenditures for private construction, $38,300,000,000—up 14 percent; for public construction, $16,000,000,000—up 4 percent; for private residential building, $22,400,000,000—up 24 percent, accounting for four-fifths of the overall increase in value of new construction put in place.

Highway construction expenditures in the first 11 months of 1959 amounted to $5,500,000,000—up 8 percent from the same period in 1958.

SIDNEY C. MOODY has been named chairman of Cyanamid International Corporation, N. Y., a co-ordinating division of American Cyanamid Company's overseas operations. At the same time ROBERT C. SWAIN was elected president and director general of the division.

DR. ROBERT O. ROBLIN was elected a vice-president of the parent firm.

More Footage per Grind

...with Brunner & Lay

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BRUNNER & LAY
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6-in dia for use with "Quarry-Master" drill.

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Brunner & Lay carbide Master bits are available in sizes given. Our Rok-Bits in 1.000; 700; 600; 400; 200; J5.23; J5.5; J7.50 and standard wagon and hand held drill threads—in wide size range—and in these body types—cross, chisel, "X", cutaway and taper socket.

Write for this NEW bulletin DA 1-58 on your letterhead, stating your position.

BRUNNER & LAY
HOLE-MASTER
6-6½-7-in for use with "down-the-hold" drill.

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CARBIDE ROK-BITS • INTRASET STEEL • DRILL RODS • COUPLINGS, ADAPTERS & SECTIONAL STEEL

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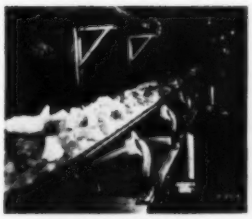
STEPHENS-ADAMSON

*AMSCO FEEDERS handle greater tonnages at lower cost per ton

Rugged S-A AMSCO Feeders take the impact delivered by thousands of tons of stone daily. Material flow from bins and hoppers can be accurately controlled up to 3000 T.P.H. and more. STEPHENS-ADAMSON AMSCO Feeders consist of a series of overlapping steel pans attached to endless conveyor chain. A wide range of pan styles are available depending on the application. AMSCO Feeder manganese steel pans and chain actually become tougher with continued use and impact. Many units are still in service after over thirty years of rough treatment. S-A builds a complete line of Feeders to fit every need.

*THE ROUGHER YOU TREAT 'EM . . .
THE TOUGHER THEY GET!
*Reg. T.M. American Manganese Steel Co.

S-A ENGINEERED PRODUCTS FOR STONE HANDLING SYSTEMS



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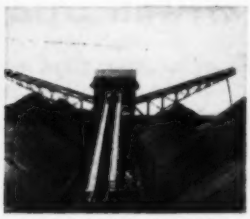

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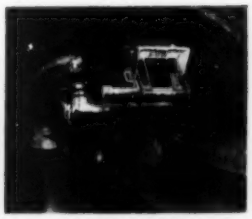

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For Maximum
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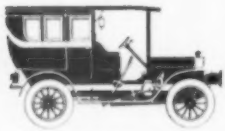
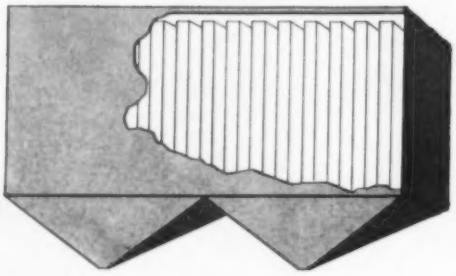
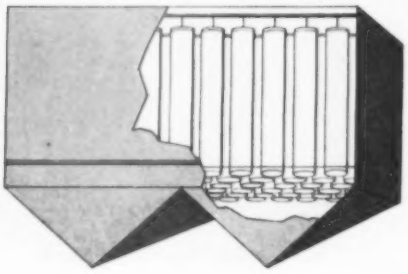


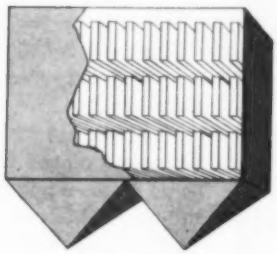
1900's
SLY DUST ARRESTER
47% less filtering area per cubic foot of filter.





1930's
SLY TUBE-TYPE FILTER
37% less filtering area per cubic foot of filter.

TODAY
NEW SLY "ROLL-CLEAN"
DYNACLONE®
Most filtering area per cubic foot of filter.



SLY DUST FILTERS PROVIDE 20 TO 40% MORE CLOTH IN A GIVEN SPACE THAN ANY OTHER DUST FILTER.

The new "Roll-Clean" Dynaclone gives: Continuous cleaning, constant suction and complete accessibility in the least possible space.

Space saved with the Dynaclone means: Lower installation costs, lower building costs, simplified piping and ductwork.

Only the Dynaclone furnishes: A single exhaust fan that does the entire job, providing *both* suction for dust collection *and* air for bag cleaning. No auxiliary blowers required.

New "Resist-O-Wear" bags in the Dynaclone offer: 200 to 300% more bag life, easier bag changing, simplicity of construction, and *job-proved* ruggedness.

More than 40,000 Sly Dust Filters in operation, including over 1,000 Sly Dynaclones, prove their advanced design. See for yourself . . .

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World-Wide Cement News

Belgian Cement Production Rose Sharply in 1959

Belgian cement production rose sharply last year. Output in the first nine months of 1959 was 3,290,000 tons—a 7.5 percent increase over the same period in 1958. (Increased production in 1958 was listed in this news column in January, page 41.) An important factor in the 1959 increase was a greater output of metallurgical cement.

Increased output of metallurgical cement is expected because of the rapid growth of the steel industry. Cimenteries et Briquetteries Reunies (C.B.R.) has opened a new plant near Liege with an annual capacity of 300,000 tons. In 1958 the total national output of metallurgical cement was slightly under 900,000 tons.

In the new plant C.B.R. proposes to revamp the old system by which steel producers manufactured their own metallurgical cement. This concern, through its various subsidiaries, controls about 30 percent of Belgium's total cement output. It also has a majority shareholding in the Dutch company, Eerste Nederlandsche Cement Industrie. The latter with its 50-percent-owned subsidiary, Cement Fabriek Ijmuiden, controls well over half of the cement production in Holland.

St. Lawrence Cement Company, Quebec, has instituted a university scholarship program for children of its employees. Any child of an employee having over two years of service with the firm is eligible if he or she graduated from high school in the top one-third of the class. All tuition and academic fees are paid to the university chosen by the recipient, and a contribution is made to living expenses.

According to Radio Peiping, a cement plant has begun operating in Kiangyu, Szechwan Province. It was built with the help of machines and technicians from Communist East Germany. Capacity was not reported.

ON STOCKPILING EFFICIENCY... AND SPEED ON THE JOB

the **MASSEY-FERGUSON 204**

Speaks for Itself:

"HAVE DONE... CAN DO!"

because it has exclusive **INSTANT REVERSE** with TORQUE CONVERTER

go forward or back... at a touch of your toe

NO SHIFTING... NO CLUTCHING... NO LEVERS TO PULL!

The Massey-Ferguson 204 is approved wherever it's used because it's the only industrial tractor that lets you move in... load... and back out without shifting, clutching, or pulling levers. This speedy, agile tractor has *"Instant Reverse"* to change direction of travel with foot pedal control. The same pedal also provides acceleration, and speeds are the same in either direction. Of course, the famous Massey-Ferguson Loader is specially designed for the 204 to make an integrated, incomparable power package. A demonstration by your Massey-Ferguson Industrial Dealer will show you how it will pay off for you, the same as it does for others.

Why Wait? — Set a Date — We'll Demonstrate!

MASSEY-FERGUSON INDUSTRIAL DIVISION

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Producing Sizeable Power for the "Sensational 60's"

MF 60-6

Industry Personalities

PAUL J. KREMER, controller of the Buffalo Slag Company, Inc., and its subsidiaries, was recently elected secretary and treasurer of the Federal Crushed Stone Corporation, Buffalo, N. Y., a Buffalo Slag subsidiary.

Cameron Sevier Jr.

CAMERON SEVIER JR. has been appointed a sales and service engineer with Basic Incorporated of Cleveland. He will have headquarters in the Atlantic district office of Basic with THOMAS P. STANTON, district manager; he will assist Mr. Stanton in servicing customers in New England, along the Atlantic seabord, and throughout the Southeastern states.

W. C. Frazier

W. R. Greer

R. J. Mahon

W. C. PRIEST FRAZIER has been appointed vice-president in charge of sales for the Lone Star Cement Corporation. He succeeds R. J. MAHON, executive vice-president, commercial, who is retiring on April 1 due to ill health, and is now on a leave of absence.

WILLIS R. GREER succeeds Mr. Frazier as sales manager of the firm's Superior Division at Seattle, Wash.

Capt. J. J. Parrilla

CAPT. JOSEPH J. PARRILLA, former marine superintendent for the Isthmian Steamship Co., has been named assistant manager of Bradley Transportation Line of Michigan Limestone Division of U. S. Steel Corporation. Captain Parrilla has been serving as a special assistant to C. F. BUEKEMA, president of Michigan Limestone.

RICHARD R. BEVAN has been promoted to the position of sales promotion manager for National Gypsum Company. He served as advertising manager of the firm's Asbestos Division for six years.

R. V. MORAN will succeed Mr. Bevan in the position he formerly held.

F. ROBERT SPROULE has been named manager of the Calcium Chloride and Public Business Department for Wyandotte Chemicals Corporation of Wyandotte, Mich., succeeding L. D. DODSON. Mr. Sproule joined the department in 1945 as a technical representative for calcium chloride.

JACK E. DALTON has been appointed sales representative for Marquette Cement Manufacturing Company in the Greater Atlanta area. He succeeds ALBERT DONNAUD, who is retiring after 30 years of service.

R. R. Smith

ROBERT R. SMITH has been named superintendent of Huron Portland Cement Company's new distributing plant at St. Joseph, Mich. In March, 1959, he had been transferred from the Detroit Riopelle Street plant to St. Joseph to oversee the construction of the new facility.

National Gypsum Company has established two new sales districts—Grand Rapids, Mich., and Columbus, Ohio.

JOHN C. WALL has been appointed manager of the Grand Rapids district. He formerly was district manager at Harrisburg, Pa.

WILLIAM F. CURTIS is now district manager at Columbus. He was formerly assistant manager of the Pittsburgh district.

JOHN P. ANDREWS will serve as assistant district manager at Columbus. The latter area previously was served through the company's Cleveland office.

HARRY B. ROBERTS, Utah division sales manager of Ideal Cement Company, has been named executive representative for the division. ROBERT E. AYERS, assistant sales manager for Colorado, will succeed Mr. Roberts as Utah division sales manager. Both men have been associated with Ideal for several years.

J. F. Knight

JOSEPH F. KNIGHT has been appointed manager of operations for the Kaiser Refractories & Chemicals Division. In his new position, Mr. Knight becomes responsible for the administration of all of the Division's manufacturing facilities in the United States.

CHARLES A. SMITH, named vice-

president of Kaiser Aluminum and Chemical Corporation after the merger with Mexico Refractories Company, will coordinate the Refractories & Chemicals Division's research and product development, technical services, engineering, and raw materials. Mr. Smith was one of the founders of Mexico Refractories.

D. P. Griffith

DAVID P. GRIFFITH has been named vice-president, operations, for the Hercules Cement Company, Philadelphia, Pa., a division of the American Cement Corporation.

Mr. Griffith was formerly plant manager at the firm's Stockertown, Pa., plant. He will continue to be responsible for operations at Stockertown, including engineering. (American Cement Corp. was formed in 1957 through a merger of Hercules, Peerless Cement Corporation, Detroit, Mich., and Riverside Cement Company, Los Angeles, Calif.)

CARL F. CLAUSEN, director of the Portland Cement Association's Manufacturing Process Department, has been elected mid-continent vice-chairman of the Industrial Minerals Division, Society of Mining Engineers. Mr. Clausen has been active in A.I.M.E. affairs for a number of years, having served on the Comminution Committee and on the Executive Committee of the Industrial Minerals Division, and also as chairman of the Cement, Lime and Gypsum Committee.

FRANCIS T. SENDKER has been named New England district sales manager for Alpha Portland Cement Company, Easton, Pa., replacing MELVILLE B. CHARD, retired. Mr. Sendker, who is now located at Alpha's New England headquarters in Boston, was formerly sales representative for the company in the Syracuse, N.Y., area. He has been with the company for 34 years.

IT'S *what's behind*
THE BALL THAT COUNTS!

...and Bituminous, too!

BEHIND BITUMINOUS is unlimited supply and ever increasing technology of utilization. *No other usable power source is backed by both these important characteristics.*

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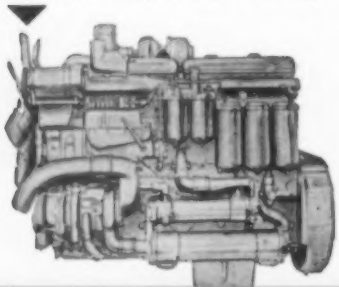
Power-steer and power-shift

with TD-25 standard equipment ...for full-load turns ...full-speed cycles!

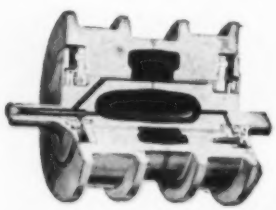
Keep big rock loads on the move *full time*, with exclusive Planet Power-steering. Full power on both tracks, full time is the answer! And Hi-Lo, on-the-go power-shifting lets you match power to condition, instantly, and keep the yard-boosting advantage of uninterrupted momentum!

Big power "plus" of the new TD-25 is the new direct-start, turbocharged 6-cylinder International DT-817 diesel engine. This versatile engine also powers International Payscraper®, Paywagon®, and rear-dump Payhauler® models — plus the TD-25. Equipment-spread power standardization simplifies your servicing and parts-stocking.



Cleaning the face of a Missouri strip mine behind a big dragline, this TD-25 shoves "tractor-sized" boulders aside with the greatest of ease. The "25" also builds dragline walkways and haul roads; pushes loaded trucks; and drastically cuts the cost of clearing new stripping areas.

Thickest-shelled roller design in the crawler industry—with king-size lube reservoirs and seal-protecting pressure-relief passages—let you power-lubricate without affecting seal life or efficiency. These are Dura-Rollers—the track rollers that make 1,000-hr lube intervals practical!



No attachment! No after-thought! No stop-gap!

Years'-proven Planet Power-steering and Hi-Lo power-shifting are *designed-in, built-in,* basic standard equipment of the new 230-hp International TD-25.

With "live-track" Planet Power steering, you get full-load king-size crawler efficiency on turns, as well as straight-aways. And Hi-Lo power-shifting gives you on-the-go matching of power to load to give you big, cycle-speeding advantages!

International Planet Power-steering eliminates load-limiting "dead-track" drag. And Hi-Lo power-shifting does away with time-wasting "gear-shift lag." No wonder the new TD-25 can outearn king-sized clutch-steered crawlers up to 50%—on tough high-walling; overburden removal; and many other coal, mineral, or building-material mining jobs!

Big-capacity track-and-engine teamwork

New TD-25 7-roller tracks are strength-matched to team with the full effort of the New 230 hp diesel engine. The "25" is platformed on super-rugged double-box-beam frames—and carried smoothly on International's new minimum-maintenance Dura-Rollers!

Press the direct-start button, to command the "25's" free-breathing diesel horsepower. Dual valving of the "25's" high-torque DT-817 engine provides for peak turbocharging efficiency—to deliver full-rated performance from sea level to timberline!

Full TD-25 performance is at your fingertips, full time!

Power-shift and power-steer the new "25" with king-sized loads—around curves, upgrade, anywhere. Compare years-proven simplified International planetary design that's engineered and located to break the load-limiting, time-losing steering and shifting bottlenecks which plague king-sized clutch-steered crawlers. Measure all the "25's" standard equipment extra value features. Let your International Construction Equipment Distributor demonstrate!

International® Construction Equipment

International Harvester Co., 180 N. Michigan Ave.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

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electro-permanent magnetic
BIG CAPACITY
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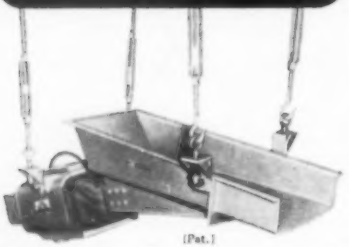

[Pat.]

Greatly increased capacity—up to 50 tons per hour • Enclosed drive element is furnished as *standard* • New A.C. electro-permanent magnetic drive • No rectifier needed—operates directly off an A.C. line • Laminated fiberglass leaf springs resist breakage • Suspended or floor-mounted models • Low power consumption; low operating and maintenance costs • Automatic, accurate, variable rate of feed for all bulk materials (fine powders to large, lumpy materials) spreading, aerating, cooling, proportioning, etc.

Special units available for hazardous, dusty locations —fully accepted by Mill Mutual. Other models available, with feeding capacities ranging from tons to ounces per hour.

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113-BB Magnet Drive, Erie, Pa.

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COMPANY_____

ADDRESS_____

CITY_____ STATE_____

ERIEZ

Enter 54-A on card, page 169

Obituaries

THOMAS L. LOVE, assistant plant manager and former personnel manager for the Calaveras Cement Company at San Andreas, Calif., died on October 31 after a brief illness. Mr. Love had been associated with Calaveras since 1934, when he served as chief clerk. His son, THOMAS L. LOVE, JR., is a member of the Calaveras sales staff.

ARMOUR WHITNEY MCDOUGALL, 73, retired secretary of the Klinker Sand and Gravel Company of Seattle, Wash., died recently in San Francisco. He and his wife were on their way to La Jolla, Calif., to spend the winter. He was a partner in Klinker Sand and Gravel for 23 years, and retired seven years ago.

WILLIAM J. FULLERTON, 90, retired engineer, died on October 27 in Albany, N. Y. He was chief engineer of the North American Cement Corporation until his retirement. Previously, he had been chief superintendent of Helderberg Cement Company of Cobleskill, N. Y., for 30 years.

CARL H. RUEDENBUSCH, 88, president of the Mayville White Lime Works, Mayville, Wis., died last December in St. Petersburg, Fla., where he had lived since 1955. He founded the Wisconsin Lime and Cement Company at the turn of the century, which later merged with Consumer Co., Inc., Chicago.

CARL L. PHILLIPS, 64, who was formerly in charge of the laboratory of the Petoskey Portland Cement Company, Petoskey, Mich., died in a local hospital recently. He had been associated with the cement firm for 37 years when he retired in 1958.

Most Complete Line Ever!

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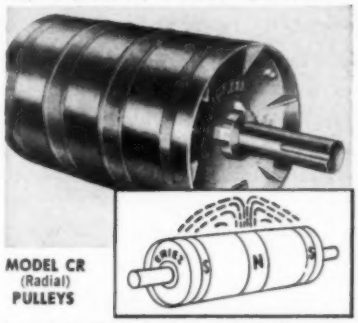
permanent non-electric
Erium-powered*
MAGNETIC PULLEYS

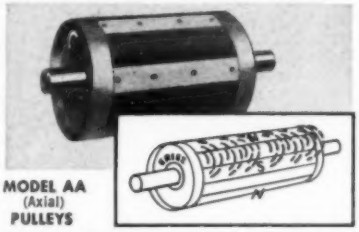
Now in 2 "duty-rated" designs—to give you the finest automatic separation for your exact application—fine iron or tramp iron removal.

NEW, EXPANDED LINE! New design, new magnetic efficiency permit increased operating range and effectiveness with 2 different magnetic actions. Peak protection for all operations —from rugged crusher protection through delicate product purification operations.



MODEL CR
(Radial)
PULLEYS

For removing large pieces of tramp iron from heavy depths of flow. Provides a strong, deep magnetic field of equal intensity around the full periphery. 12" through 36" diameters.



MODEL AA
(Axial)
PULLEYS

Excellent for nne iron separation, as well as small and medium pieces of tramp iron, in average material flows! Strong magnetic field of equal force extends across the full width of the pulley. 8", 12", 15", & 18" diameters.

Prevent product contamination, machinery damage, fires, explosions, downtime. 2 designs, 4 magnetic strengths, 8 diameters, 14 belt widths. No operating or maintenance costs. For all materials, wet or dry, on belts of non magnetic material. Fast, simple installation.

**Erium* —an exclusive, high quality permanent magnetic power source specifically designed and energized by Eriez.*

New fact-filled 6-page bulletin has installation photos, selector guide, etc. Write today! Eriez Mfg. Co., 113-BA Magnet Drive, Erie, Pa.

ERIEZ

Enter 54-B on card, page 169

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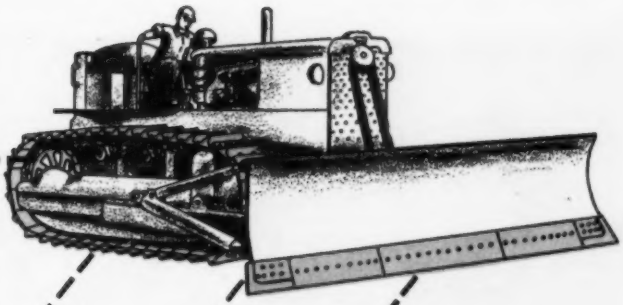
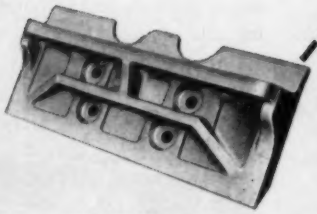
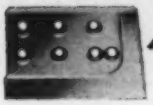
RENEWABLE SPROCKET RIMS

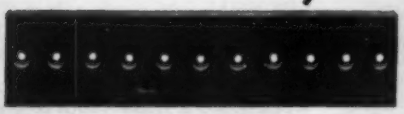




TRACTOR PADS



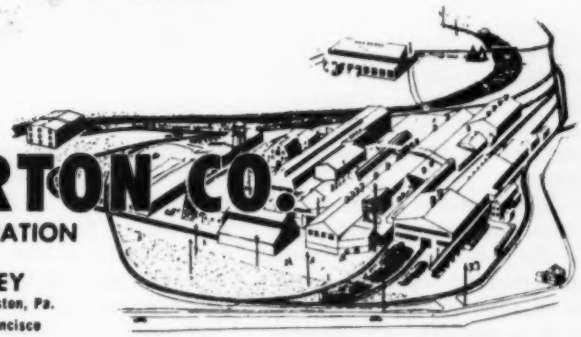
END BITS



DOZER BLADES

TISCO®
TRACTOR REPAIR PARTS

Made of tough Manganese Steel which "improves with age" becoming harder from impact and the stress and strain of machine operation, Tisco Sprocket Rims, Tractor Pads, End Bits and Dozer Blades are designed to give longer service life and greater economy of operation - - **WRITE TODAY FOR BULLETIN 1-59** which describes how worn sprockets can be readily reclaimed; how it has been possible for special design features to be incorporated into Tisco Tractor Pads and how Tisco End Bits and Dozer Blades resist abuse and abrasion.



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SALES OFFICES: New York — Chicago — San Francisco

new machinery

● A high-capacity belt loader for loading large trucks, wagons, scrapers, and other carriers has been introduced by Jebco, Inc. The Jeb-Loader is designed to team with the larger motor grader of the LeTourneau-Westinghouse and Caterpillar lines. According to the manufacturer, the Jeb-Loader can cast up to 1,750 cu. yd. an hour and load up to 800 cu. yd. an hour.

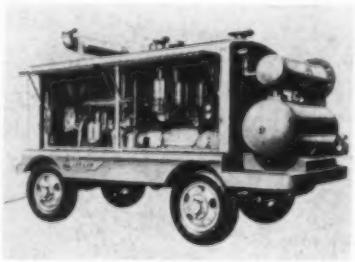
The Jeb-Loader has a 30-ft. conveyor that reaches 15½ ft. high at the discharge end. A 32-in. diameter cutting disc feeds material to a trough-shaped belt, which travels at 614 f.p.m. Scrapers bolted to the conveyor frame keep the belt free of clinging dirt.

For travel, the conveyor is disconnected and trailed behind the motor grader on the tandem wheels. **(351)**

● A lever-type grease gun that provides either high pressure or volume delivery of lubricant by means of a simple shifting device has been developed by the Lincoln Engineering Company.

Changing pressure ratios is accomplished by shifting a latch pin in the handle from one slot to another. The manufacturer reports that pressures up to 10,000 p.s.i. can be achieved in the high pressure position, and full pressure can be obtained with a stroke length as small as ¼ in. to facilitate working in close quarters.

The gun is of all-steel construction with rust-resistant nickel plating. It is equipped with a hand-fitting, grease-resistant, rubber pistol grip, and a nozzle extension that swivels 360 deg. for easy access to fittings. Loading can be done in three ways: with standard 14½-oz. grease cartridge, with Lincoln filler pump, or by suction. Overall length is 20 in., with a 2¼-in. barrel diameter. **(352)**



● The Jaeger Machine Company has introduced a rotary air compressor which delivers 900 c.f.m. of air at an operating speed of 1,700 r.p.m. It is powered by the Model 6-110 GM Diesel which, in other compressors, is usually operated at 1,800 r.p.m. full load speed. This reduction of 100 r.p.m. in engine speed is reported to result in a fuel factor of more than 500 c.f.m. of delivered air per pound of fuel consumed. Engine and compressor wear are also reduced.

Close automatic regulation on engine and compressor maintains 100 p.s.i. minimum air pressure under all normal demand. Engine speed modulation is smooth and stepless and prevents over-run or racing. Stopping and starting require the half-turn of a regulator crank.

Standard equipment includes two-pass exhaust muffler, automatic blow-down valve, swing-type check valve, copper tube finned multi-pass oil cooler, hour meter, adjustable radiator shutters, and automotive steering axle. **(353)**

● A heavy-duty auxiliary axle unit designed primarily for on- and off-the-highway operation is available from the Natchez Steel Products Company.

The unit, known as the Double Loadster, is an automatic retracting axle assembly, riding up and free when unloaded, and down to distribute the weight when loaded—all automatically. Savings in tire wear, fuel, and maintenance have been claimed for the unit.

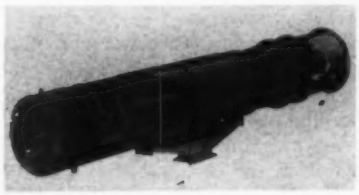
Designed for top-of-the-frame mounting on any model truck or tractor, the Double Loadster is a self-contained unit, and requires no alteration to the frame.

The units are applicable to a broad range of truck operations. In both

and equipment

for further information use card on page 169

dump body and fifth wheel applications, the unit can easily be transferred from truck to truck. (354)



● Joy Manufacturing Company's Microdyne dust collector is a compact, wet inertial unit, described as being from 1/10 to 1/20 the size of other collectors. It collects over 90 percent of all dust particles 5 microns and larger, 92 percent of 2 micron dust, and substantial amounts of smaller dust.

Cylindrically shaped, the Microdyne installs directly into the duct system. It has three main sections—a mixer section, an eliminator section, and a booster fan section (the only moving part).

The Microdyne is available in ratings from 2,500 to 64,000 c.f.m., constructed of mild steel or Type 304 or 316 stainless steel for corrosive and erosive conditions. (355)

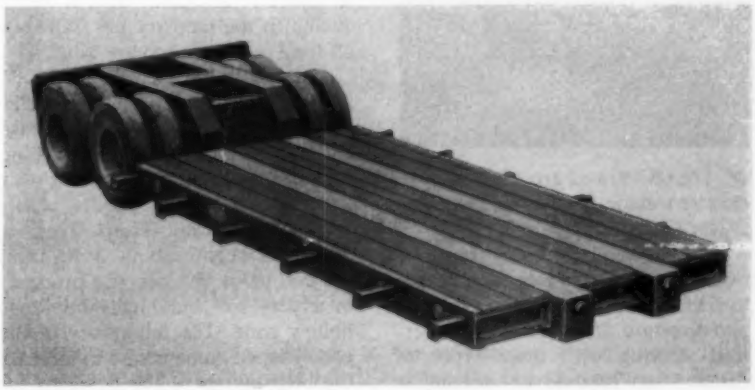
● A new series of spherical bearings, rod end bearings, and bushings using Teflon TFE-Fluorocarbon fiber has been developed to operate without lubrication. Their projected use includes the field of mining and quarrying equipment. The bearings' simplicity of design results from two years' engineering work by the Radial Bearing Corporation.

The bearings utilize the fiber's low coefficient of friction—from 0.01 to 0.04, depending upon the particular service—and offer a combination of properties excellently suited to low surface speeds, high unit loads, or applications subject to high dynamic loading. This high load-carrying potential allows their use where normal loads are light, but where impact or high overloads often occur. The bearings are engineered for automatic self-alignment to compensate for mounting inaccuracies or deflections. (356)

● A free piston pump with only nine moving parts has been developed by the Crossley Machine Company for pumping slurry and concrete. The pump impels a continuous air-free flow without pulsating or surging, and can be operated submerged with complete safety and efficiency, according to Crossley engineers. It requires no safety or relief valves; when a stoppage occurs, the pump stops. There are no motors, engines, or related parts.

The pump is operated by compressed air which is introduced into each cylinder in sequence; while the left cylinder is discharging, the center cylinder has filled and is waiting, and the right is filling. Chambers fill by gravity. In each chamber is a nylon free-floating piston and two nylon ball valves.

Operation is automatically controlled by a separate control box. Because one chamber can be stopped while the other two continue to function, the pump can operate indefinitely without being shut down. (357)



● Talbert Trailers' Challenger line is offered in both drop and level deck models with 18-, 27-, and 36-ton load capacities.

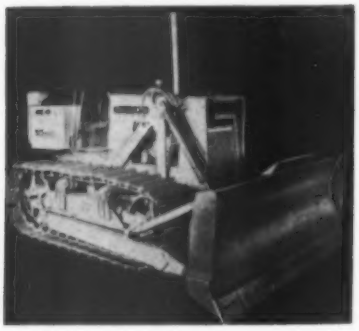
Included as standard equipment on both models are high tensile steel construction throughout, Hendrickson tandems, 2-in. longitudinal oak flooring, lashing rings, I.C.C. clearance lights, and directional lights. The low bed model features a removable gooseneck.

Designed to increase payload capacity by reducing empty weight, the Challenger retains a practical, usable deck size in all models. (358)

● Fruehauf Trailer Company is building a new cement hopper which is lighter than previous models, with full 26-in. butterfly gate at the bottom for quick unloading.

Design of the hoppers permits weight reduction along with larger capacity. The standard units have 510-cu. ft. capacity each, but can be obtained in larger capacities.

Among the weight reducing features are the all-aluminum fill dome and interliners. The interliners are removable for conversion to aggregate hoppers. The 20-in. aluminum fill dome and cover are standard height. (359)

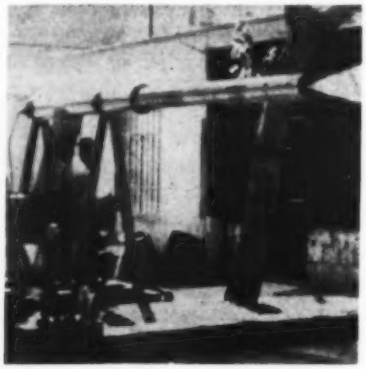


● The OC-9, a 62 gross horsepower crawler tractor, is announced by The Oliver Corporation.

The OC-9 offers a new transmission that provides independent power to each track, controlling both speed and direction. It also features powerized steering with three types of turns. Each method of steering is smooth and easy, accomplished by hydraulically actuated disc clutches, operating in oil. Larger and heavier track wheels, improved track positioning, and stronger, heavier frames are other features.

Powered by a four-cylinder, valve-in-head diesel engine, the OC-9 is rated to deliver 62 gross engine hp., 57 net flywheel hp.

The OC-9 is also available in a factory-built, 1-cu. yd. loader model, the OC-96, which features low-profile design with all loader components below the engine heads. (360)



● Clare J. Hoffman, Inc., is introducing to the industry the Calzolari oil-fired burner for rotary kilns. The Calzolari kiln burner was developed in Italy, where in specific installations, it has been reported to increase kiln output 20 percent over existing fuel oil burners and 10 percent over existing coal burners.

The flame that results from its operation begins about 3 ft. from the end of the burner and proceeds in a very soft but highly luminous hollow cone. The luminosity of the cone-shaped flame is said to increase the heat output of the flame by increasing the amount of radiated heat and by increasing the emission factor of the flame.

Highly maneuverable, the Calzolari burner can be moved into and out of place quickly and can be adjusted with respect to the remainder of the kiln parts. (361)

● Hewitt-Robins, Inc., has developed an extensible mine conveyor which can operate as long as a week or more without being moved.

This unit is designed for use in underground hard rock mining. It is comprised of a belt which rides on idlers mounted on sled-like skids spaced at 5-ft. intervals. The skids are held in alignment by wire ropes. A conveyor may be constructed with as many as 200 skids, making a unit 1,000 ft. long. The equipment is located behind the mine loader which receives material from the continuous mining machine. A crawler tractor is attached to each end of the conveyor, exerting constant tension on the belt to keep it taut.

A traveling tripper permits variation in the distance from the conveyor loading point to discharge. Material can be handled at a rate of 400 t.p.h. for 70 hours or more without moving the equipment. When moving is necessary, the tractors tow the entire unit in long sections. The tractors are equipped with hydraulic jack so that one of them can be positioned under the tripper, lifting it off the ground and carrying it to the new work area. (362)

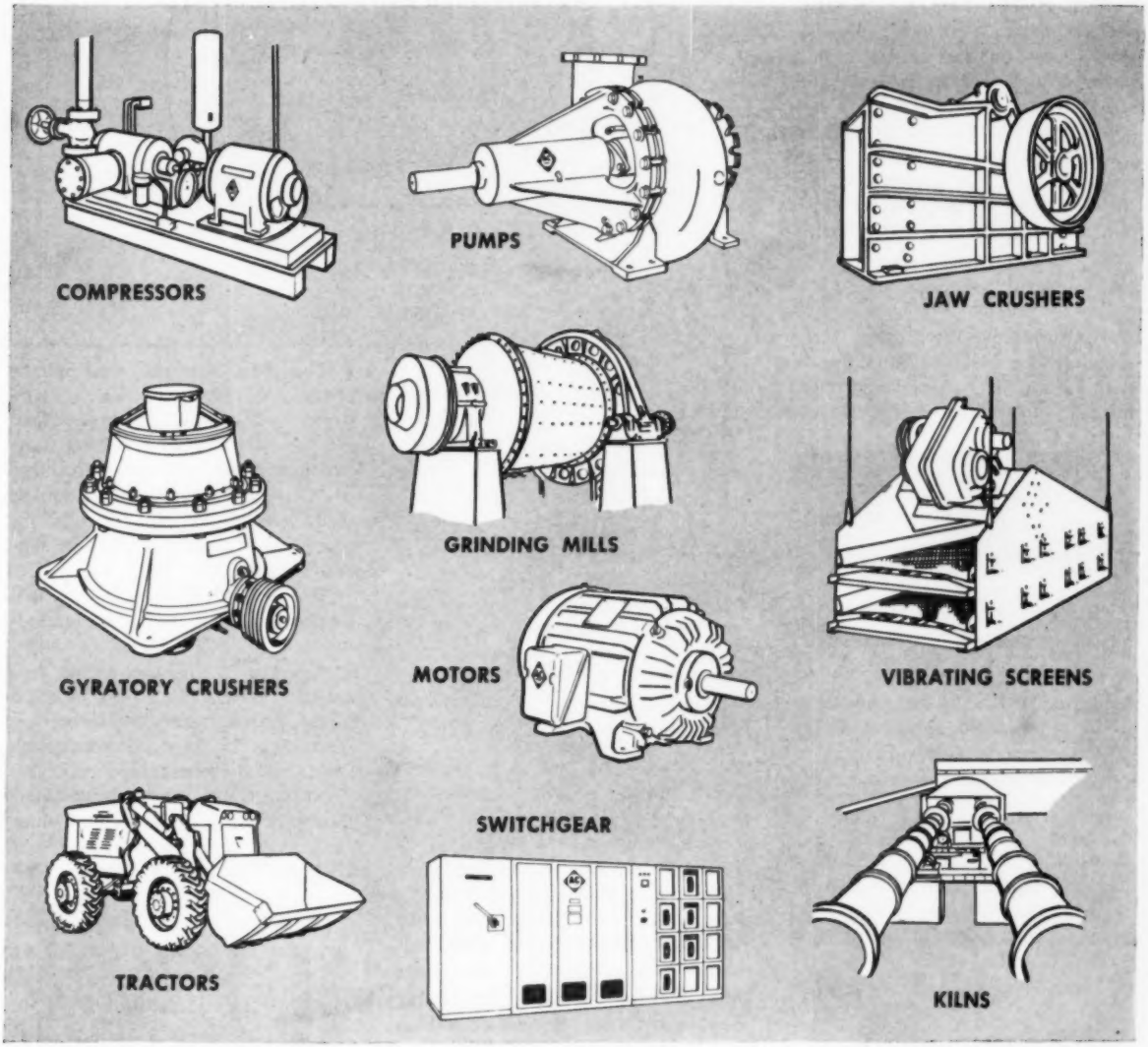
● Introduction of the Types 1800 and 1800SC has been made by the Baldwin-Lima-Hamilton Corporation.

As a standard shovel the Type 1800 is equipped with a 35-ft. boom,

26-ft. 10-in. dipper handle, and 5-cu. yd. dipper; as a crane it has a lifting capacity of 112 tons; dragline capacity is variable. A 7- or 8-cu. yd. dipper is also available.

The Type 1800SC is a 140-ton capacity crane, with extra long crane

ALLIS-CHALMERS



From pit to storage...

boost plant efficiencies...modernize with Allis-Chalmers full-process package

A-C engineers are uniquely capable of analyzing your entire operation and suggesting methods for improving your plant efficiencies. Fuel consumption, power demands, maintenance — all big profit eaters — are apparent to their cost-cutting eyes. And they don't make "guesstimates" — years of experience in the rock products industries furnish them with a background for accurate appraisal. New and unusual problems are referred immediately for test in Allis-Chalmers laboratories and pilot test plant facilities. A-1239

In addition to the equipment shown above, Allis-Chalmers offers a complete line of processing equipment, related electrical distribution, driver and control equipment, pumps and valves for all fluid-flow problems.

Contact your Allis-Chalmers representative or write ***Allis-Chalmers,*** *Industrial Equipment Division, Milwaukee 1, Wisconsin.*

See our exhibit at the Sand and Gravel and Crushed Stone Shows.

booms with jibs available for high lift work. Both models are air-operated rigs and are available with diesel or electric power with torque converter drive.

A standard width base is available for the Type 1800, and an extra-wide base for the 1800SC. Both bases are of one-piece cast steel construction.

Each side frame assembly is removable as a unit. Counterweight segments are also removable, and the backhitch-telescopic-type gantry can be folded to a height of 17 ft. 5 in. (363)

● Hydro-Dredge Accessory Company offers a 14-in. i.d. suction hose with carbon steel nipples and flange molded and welded to hose. Overall

length is 10 ft. The hose has a ½-in. wear tube, wire reinforced. Clamp strips of heavy fabric are included on each hose end. (364)

● Addition of a complete range of pneumatic-tired radial stackers to its line has been announced by the Kolman Manufacturing Company. These

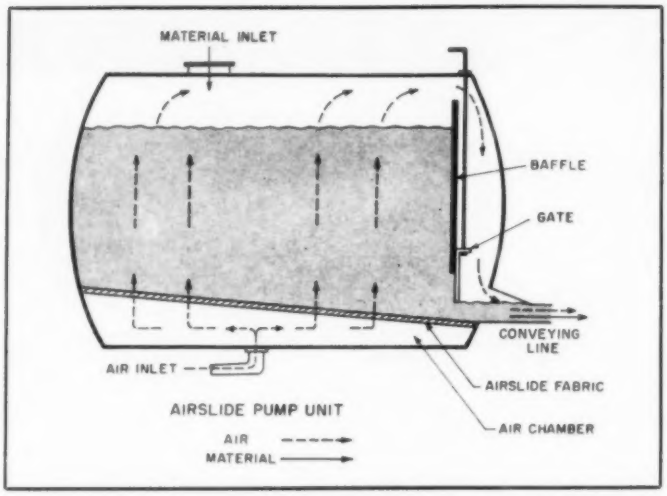
stackers are available in sizes from 90 ft. to 150 ft. long and in 18 in. through 36 in. widths.

The stackers feature a cable suspension design which permits raising and lowering while stockpiling, to keep the head pulley near the top of the pile at all times. Electric or mechanical power lift and power travel are available, giving the operator finger-tip control over the exact location of the stacker discharge point at all times.

Dual pneumatic tires, and a swivel wheel feature which permits the wheels to be moved from the radial arc position to a parallel position, enable the stacker to be readily relocated in the stockpile area without disassembly. (365)

● A new power take-off for high energy, high speed applications is available from the Twin Disc Clutch Company. Designated Model IBF-214P, this unit is especially suited to rock crushers, conveyors, and other equipment that must start under heavy loads. These advantages are claimed for the power take off: it withstands high energy heat loads; it can be applied to high speed engines up to 3,380 input r.p.m.; it operates up to six months between lubrication periods.

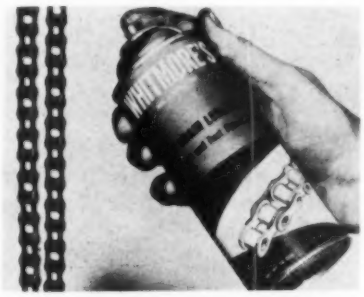
Too-heavy starting loads create uneven thermal stresses which can cause minute cracks in the center plate and eventually lead to clutch failure. Twin Disc reports that its new power take off overcomes this problem by means of a ventilated center plate. This plate is designed in two sections with diagonal ribs cast into each section. Placed back to back, the ribs cross each other to form only small diamond-shaped contact areas, permitting air flow to dissipate excess heat. (366)



● Dry bulk material feed into a pneumatic conveying line is controlled as to volume and material-air ratio by a new low-pressure tank and pump combination introduced by the Fuller Company. A single source of air supply provides the pressure for unloading, feeding, and conveying.

The Airslide Pump, as the new unit is called, can be conveniently mounted on truck, trailer, or skids; it serves as a self-discharging bulk carrier. Essentially a tank in structure, it is of lightweight construction, increasing the payload permissible within weight limitations.

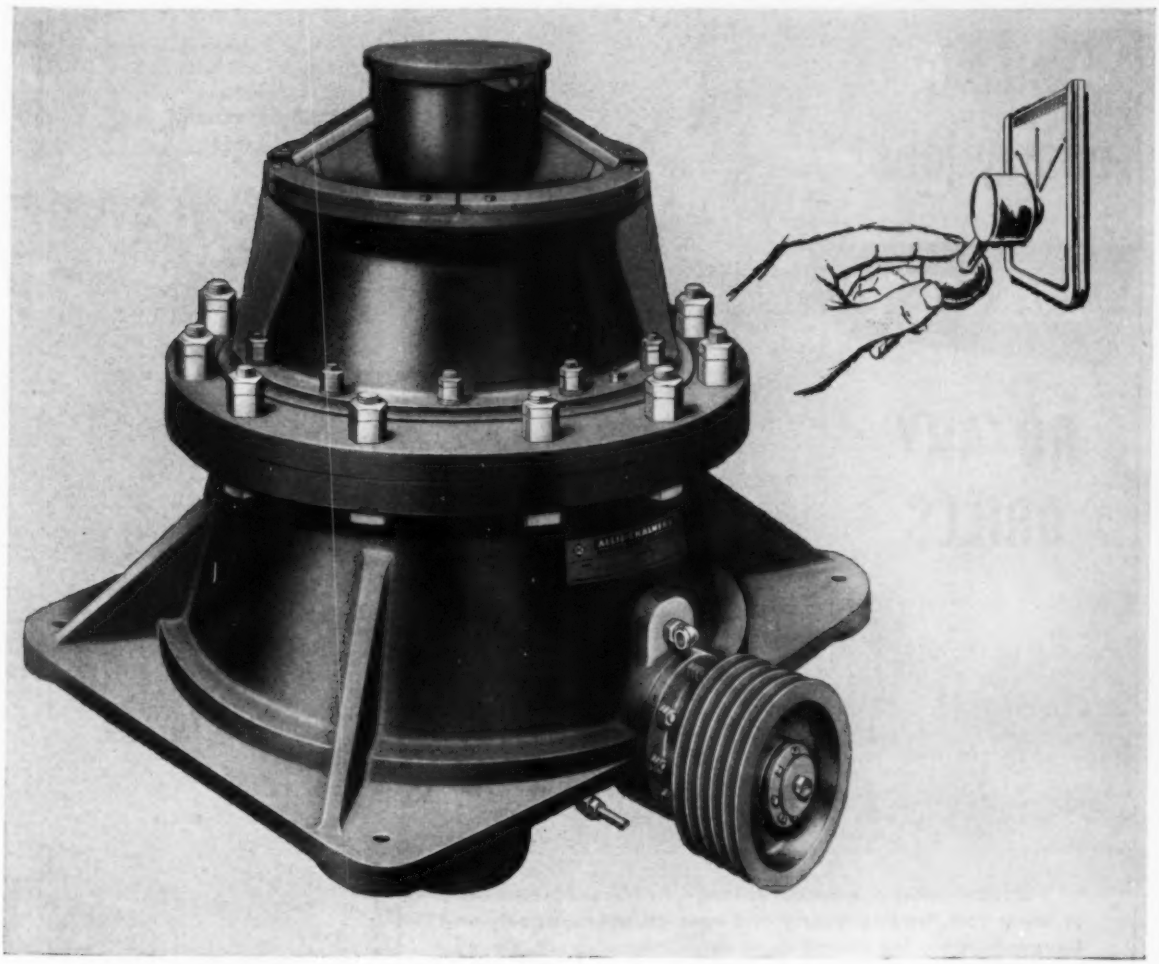
Applications successfully field-tested include the handling of materials such as cement, fly ash, and hydrated lime. (367)



● A free trial sample of a new open chain lubricant is offered by The Whitmore Manufacturing Company. The lubricant is packaged in a 16-oz. pushbutton aerosol container for quick application to conveyor, elevating, and transmission chains of all types.

The lubricant combines the features of a penetrant, a lubricant, and

ALLIS-CHALMERS



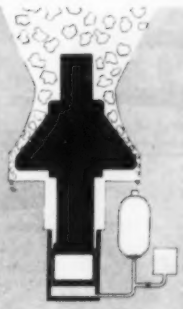
Get any crusher setting at the flip of a switch

1-man, 1-minute product control

Adjustment to product size . . . compensation for wear . . . emergency unloading . . . all of these operations can be done by one man in just one minute with Allis-Chalmers revolutionary *Hydrocone* crusher.

Compare the speed and simplicity of *Hydroset* control with the time-consuming inconvenience of any other method of changing crusher settings — in any other gyratory-type crusher. You'll discover that the *Hydrocone* crusher can actually add hours of production time to your day . . . give you increased tonnage and greater profits by eliminating excessive and costly downtime.

Get all the facts about the *Hydrocone* crusher with *Hydroset* control. See your A-C representative or write **Allis-Chalmers,** Industrial Equipment Division, Milwaukee 1, Wisconsin. A-1240



Hydraulic jack supports cone; crusher setting is controlled by the amount of oil in the jack. A flip of a control switch, conveniently located, positions the cone at any setting.

Hydrocone and Hydroset are Allis-Chalmers trademarks.

cut costs on big quarry jobs!

There's a Davey Rotary Drill to meet every drilling requirement!

DAVEY

ROTARY DRILLS

For faster, more economical drilling . . . increased production at lower cost, leading quarry and open-pit operators rely on Davey. Suitable for mounting on any make of truck, Davey Rotary Drills move fast between blast holes . . . are easy to set in drilling position.

Daveys are available in 8 different models—air blast, mud pump, or combination types. Rated capacities to 3,500 ft. Outstanding features include choice of power take-off or separate power unit operation, automatic hydraulic feed, hydraulic pull down, heavy-duty rotary table, rugged tubular box-type mast.

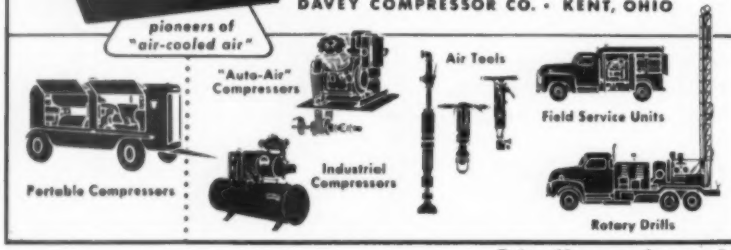
AA 6947

Write for full details!

DAVEY

pioneers of "air-cooled air"

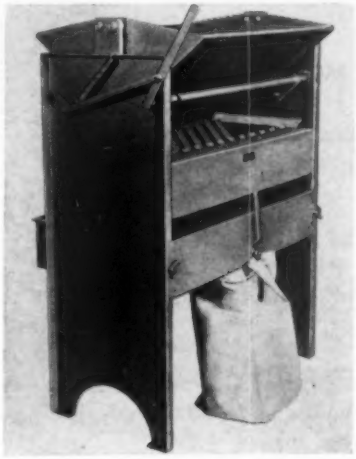
DAVEY COMPRESSOR CO. • KENT, OHIO



Enter 62 on card, page 169

a rust-preventive to lengthen open chain life. It was developed to work into close-tolerance, internal friction surfaces of open chains—between bushings and pins and bushings and rollers—to reduce wear and dissipate heat. It features a built-in corrosion inhibitor which is said to prevent rust and corrosion of open chain in all climatic conditions. **(368)**

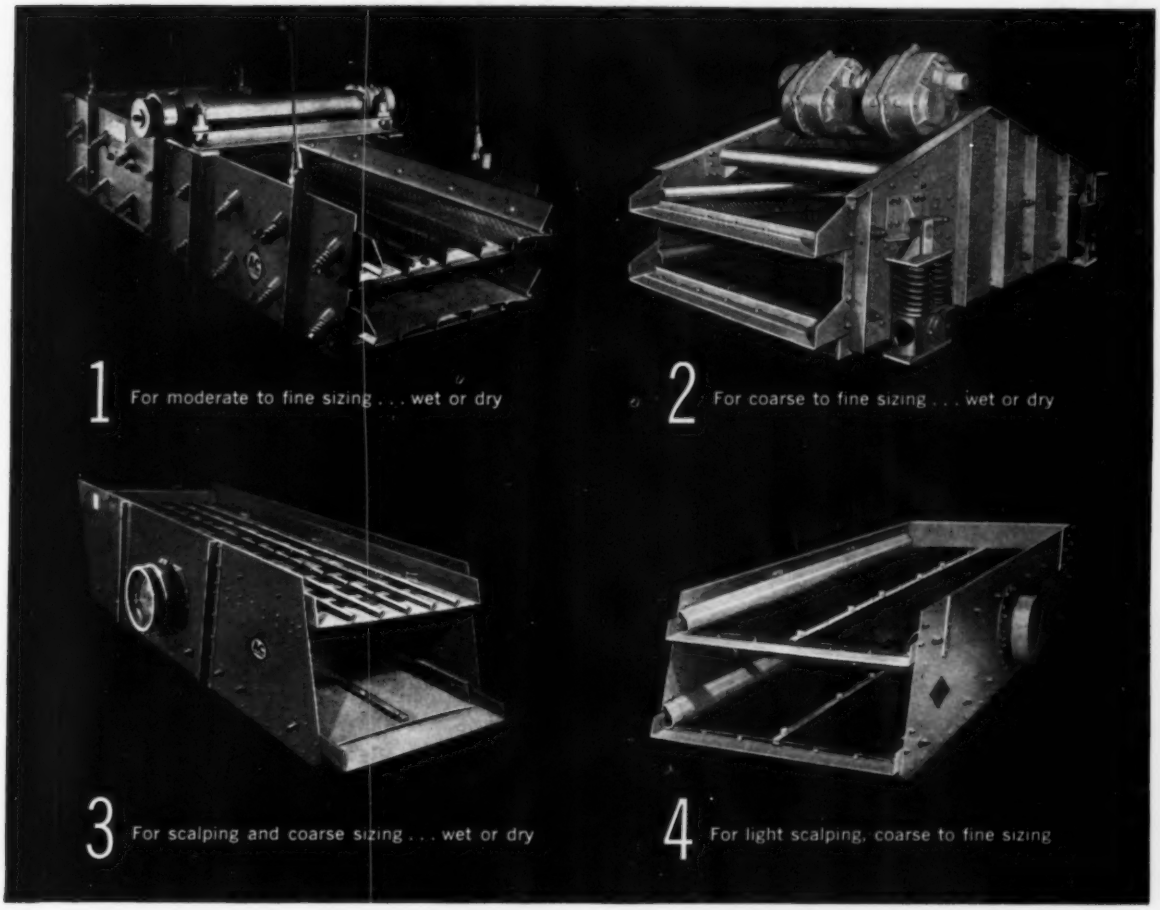
● This hydraulically-operated Case Model 1000 crawler tractor with brush rake was one of the new machines introduced by the J. I. Case Company at its 1960 World Premier in Bal Harbour, Fla., in January. **(369)**



● An improved sample splitter for the reduction of aggregate samples, from sand through coarse sizes, has been announced by the Gilson Screen Company.

The sample to be reduced is placed in a lever-actuated clamshell hopper where it may be leveled or evenly distributed by hand. The sample may

ALLIS-CHALMERS


1 For moderate to fine sizing . . . wet or dry
2 For coarse to fine sizing . . . wet or dry
3 For scalping and coarse sizing . . . wet or dry
4 For light scalping, coarse to fine sizing

Pick a screen to fit your job

. . . be it scalping, sizing, rinsing, washing, or heavy media recovery

Large or small capacity — wet or dry crushed stone, sand or gravel — whatever your application there's an A-C screen for the job. Building the industry's most complete line of horizontal and inclined screens, Allis-Chalmers gives unbiased recommendations — suggesting to you the screen that will do your job at the lowest possible cost consistent with quality.

Built for a beating: There's no skimping on quality at A-C. For example, the frames of Allis-Chalmers screens are carefully machined and *stress relieved* for years of tough usage.

Easy to choose: A helpful screen selection guide has been prepared to help you pick the right model screen for your process. *Contact your Allis-Chalmers representative or write for Bulletin 25B6280. Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada write Canadian Allis-Chalmers, Ltd., Box 37, Montreal, Quebec.*

1 **For moderate to fine sizing** — wet or dry. AVS *Aero-Vibe* inclined screen: Available with wire cloth or perforated plate surfaces. Maximum aperture — 1½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 5 by 10 feet.

2 **For coarse to fine sizing** — wet or dry, rinsing, or media recovery. *Low-Head* horizontal screen: Saves headroom. Wire cloth or perforated plate. Apertures to 2½ inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

3 **For scalping and coarse sizing** — wet or dry. XH *Ripl-Flo* inclined screen: Wire cloth, perforated plate, rod or stepped grizzly-bar surfaces. Apertures to 10 inches. 1, 2 or 3 decks. Sizes 4 by 8 to 8 by 14 feet.

4 **For light scalping, coarse to fine sizing** — wet or dry, and for rinsing. SH *Ripl-Flo* inclined screen: Wire cloth or perforated plate. Apertures to 5 inches. 1, 2 or 3 decks. Sizes 3 by 6 to 8 by 20 feet.

Aero-Vibe, Low-Head and Ripl-Flo are Allis-Chalmers trademarks.

A-1215

RUGGED AND RIGHT FOR YEAR 'ROUND WORK

in really cold weather!

MARION BODIES AND HOISTS

Heated Floors Allow Landers & Griffin, Inc. To Keep Working All Year On Route 93 in New Hampshire.

Six Marion units with heated floors from the truck exhaust have made it possible for one contractor to keep going all year in the really cold White Mountain region.

Another six units owned by the contractor but with unheated floors are also on-the-job. All twelve have Model MFR bodies with a capacity of 11 to 12.3 yards. Marion hoists are twin underbody arm type Model HD-88.

Payload performance on the six with heated floors averages 1800 yards per 11-hour shift, traveling both uphill when loaded and in heavy traffic.

The prime contractors, Landers & Griffin, Inc., jointly sponsored with Morrison-Knudsen Co., are building 4.05 miles of Route 93 at an estimated cost of $2.7 million.

Ed Graves, Equipment Supt., says, "We like Marion bodies and hoists very much. We have used Marions for a long time and will continue to do so. The service provided by Marion's Distributor is beyond compare."

If you want to keep going and ahead of schedule, why not see your Marion Distributor or write direct for profit facts.

MARION METAL PRODUCTS CO.
Marion, Ohio, U.S.A.

Enter 64 on card, page 169

consist of a pound of fine material or more than a cubic foot of coarse aggregate. Lever-opening of the hopper releases the sample precisely on the center line of the splitter chutes below. Each half of the resulting split retains the character of gradation of the original total sample. Width of the chute openings can be adjusted from ½ in. to 6 in. Two material pans rest on glides under each half of the splitter chute. (370)

● One man can install belts easily with Far-Pul belt clamps, available from the Flexible Steel Lacing Company.

The belt is inserted between the bars of the clamp and bolts are tightened down. The tensioning bar is then slipped over the studs on the opposite bars. Belt ends are drawn together with jacks. When the fasteners are properly meshed, a pin is inserted through the loops of the lacings, tension is released on the jacks, bars are removed from the belt, and the belt is ready. (371)

● United Conveyor Corporation has available a newly-developed valve for abrasive slurry applications. The valve can be installed in any position and operated remotely with air or hydraulic cylinder. There are no slots or guides interfering with valve movement and no sliding metal to metal parts to wear. The valve is suitable for working pressures of 150 p.s.i. (372)

B.F.Goodrich

Copter hop over the new Niagara

Ride in the Bell Ranger and see how B.F.Goodrich tires help build the world's mightiest power project

SOON THE CHURNING WATERS of the Niagara River will be generating more electrical power than ever—over two million kilowatts, enough to light a city the size of Chicago.

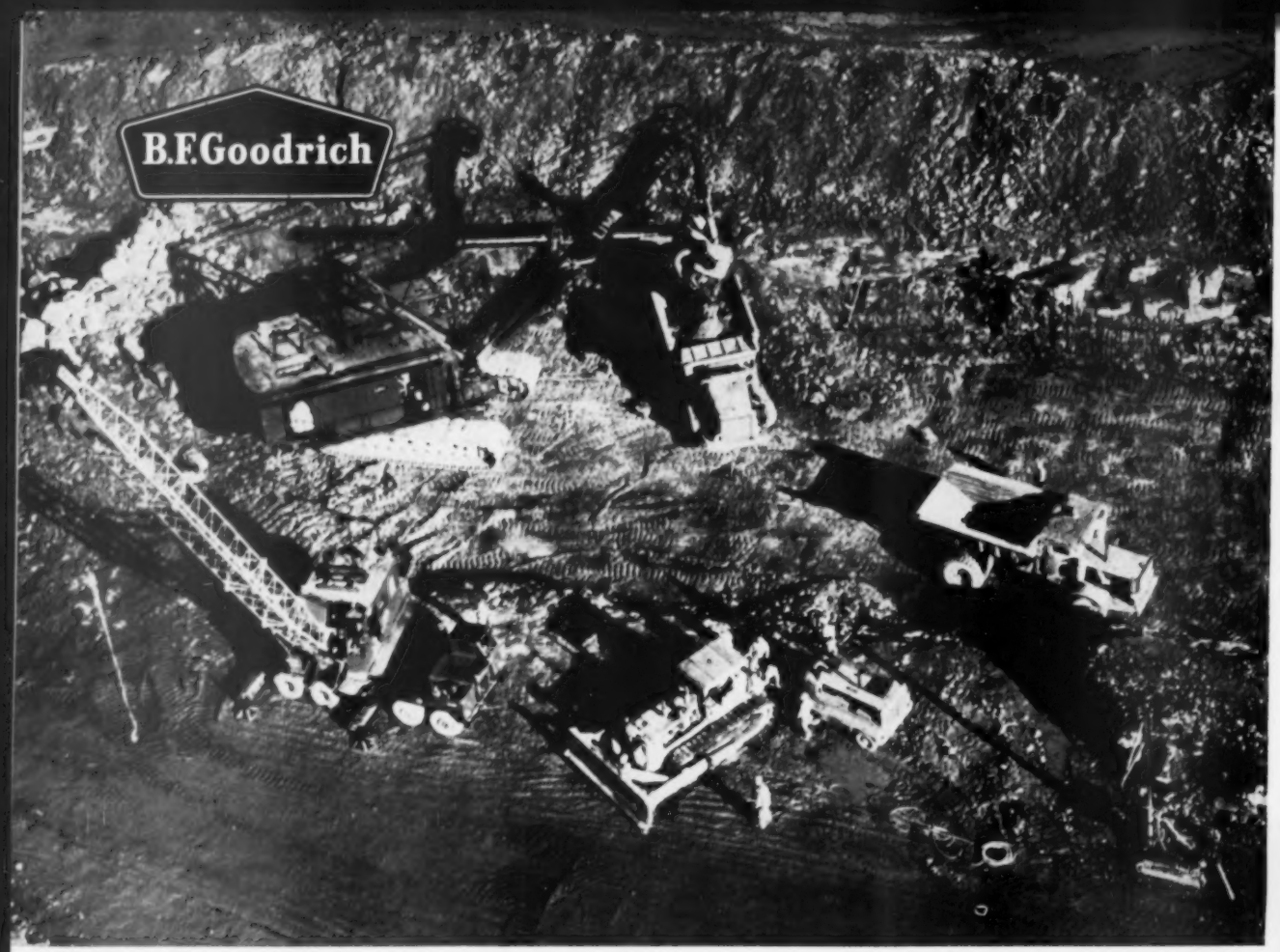
More electricity at lower cost is what we'll get from the $720-million Niagara Power Project, one of the biggest peace-time construction jobs in our history.

Already trucks and other earth-movers have shouldered their loads more than 800,000 times—enough trips to take them ten times around the world.

To cope with the challenges of this and other tasks, Merritt-Chapman & Scott Corporation, largest contractor on the project, uses B.F.Goodrich tires and other products.

NOW WE'RE AT 3,000 FEET. Below us is the entire Niagara Project. At the upper right are the Falls. At upper left, 2½ miles above the Falls, is the Intake Area. Here water will be diverted from the Niagara River into 2 giant covered conduits, each of which is as wide as a 4-lane highway and 5 times higher than the Holland Tunnel. These conduits take the water into the vast Storage Reservoir. From there it moves to the new Niagara Generating Plant, where it plummets down to drive 13 generators. Turn the page and learn how this mammoth job is progressing with the aid of B.F.Goodrich tires.

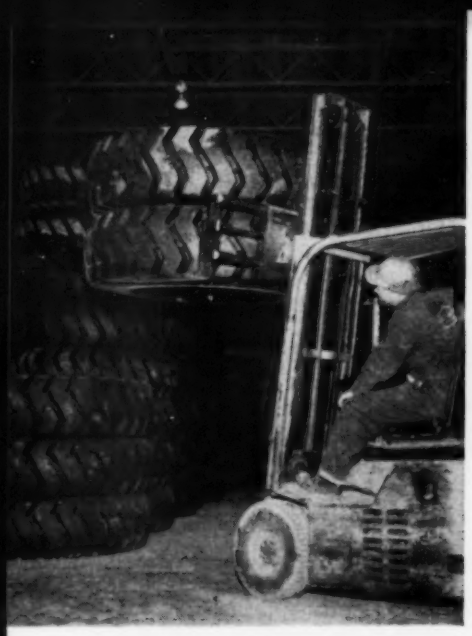
This B.F.Goodrich report continues ▶



SWOOPING DOWN we come over the conduit area that will carry water from the Niagara River to the new reservoir. Excavations for the 46′-wide covered conduits are 110′ x 50′. The trucks below us, hauling away rocks, are equipped with B.F.Goodrich tires. Altogether, more than 2100 B.F.Goodrich tires—on dump trucks, loaders, graders and other equipment—work 'round the clock, six days a week, rolling over rock-strewn Niagara excavation sites.

See how 2100 B.F.Goodrich tires

B.F.GOODRICH ROCK SERVICE TIRES have run up amazing service records at Niagara—over 5,000 hours in some cases! The new B.F.Goodrich Cut Protected tread compound is outstandingly successful at withstanding cutting and chipping from abrasive Niagara rock. Massive double-chevron Rock Service cleats give extra traction in forward or reverse. And because of the B.F.Goodrich Flex-Rite Nylon cord body, Rock Service tires are almost immune to heat blowouts and flex breaks. Result: you get more original-tread hours of service, more retreadable tires.



TO GIVE CONTRACTORS what they need *when* they need it, B.F.Goodrich built a warehouse near the Niagara project. A complete line of B.F.Goodrich tires is stored, ready for every emergency. At the B.F.Goodrich Tire Service Building on the job site, a crew of trained tire maintenance men works in shifts, 'round the clock.

IT'S AN EMERGENCY, and the B.F.Goodrich Tire Service Man is there. He's trained to handle any type tire on any type equipment. He has at his disposal all the latest power tools, such as hydraulic cranes, pneumatic wrenches, bead jacks. Background: 13 penstocks at Niagara Generating Plant will direct torrents of water into giant turbines. Penstocks are 462 feet long.

are helping men harness Niagara

From the beginning of work on the Niagara Power Project, B.F.Goodrich on-the-scene specialists have helped determine exactly the right B.F.Goodrich product for each particular job. In addition to Rock Service tires (now available in the new Cut Protected compound), B.F.Goodrich Rock Logger, Tractor Grader, All-Purpose, Mud-Snow and Power Express tires are at work.

B.F.Goodrich hose feeds air to machines drilling dynamite holes. B.F.Goodrich rain suits, gloves and footwear protect hundreds of construction workers. B.F.Goodrich conveyor belts will carry materials for 1,300,000 cubic yards of concrete, total required for the entire generating plant. And helping to keep the whole project humming are special B.F.Goodrich maintenance and service facilities—all part of the new B.F.Goodrich Unified Contractor Program.

No matter what your off-the-road job, B.F.Goodrich is ready to serve you, and help you save. Your Smileage dealer is listed under Tires in the Yellow Pages of your phone book. *The B.F.Goodrich Company, Akron 18, Ohio.*

SPECIFY B.F.Goodrich Tubeless or tube-type tires when ordering new equipment.

Smileage!

B.F.Goodrich *off-the-road tires*

Enter 65 on card, page 169

Case Unveils 1960 Product Line—

Slated to Sponsor 1961 Paris Road Show

THE J. I. Case Company, in a dramatic world premiere in Bal Harbour, Fla., recently unveiled its entire product line for 1960.

The Case line now includes the following: a complete series of hydraulic-drive wheel tractors, with streamlined, air-cooled, all-weather cabs; the first U. S.-manufactured small diesel tractor to compete with European imports; and a full line of construction, roadbuilding, and materials-handling wheel and crawler tractors and equipment.

Also unveiled was a brand-new hand and power tool line. These will be marketed by means of a fleet of more than 500 specially designed trucks. Each vehicle has a special display window. In addition to the new Case equipment lines, dealers for the first time saw the new "Case building," which will be sold through a recently organized subsidiary, Case Building Corporation.

The Case Company's World Premiere was the largest ever held. Over 7,000 Case award-winning dealers from all over the world, dealer personnel, and their wives were flown to the premiere site at the luxurious Americana Hotel in Bal Harbour, Florida. (The airlift is said to have been the biggest civilian airlift in history, surpassed in scope only by the Berlin airlift of a few years ago.)

Major emphasis for 1960 and the decade just ahead was placed on the Case construction, roadbuilding, and materials-handling line of wheel and crawler tractors and equipment. Marc. B. Rojtman, Case president, revealed the company's plans for an International Construction and Roadbuilding Conference to be held in Paris, France, in 1961, to commemorate the Case Company's newly gained position as one of the ten largest manufacturers of construction machinery in the world.

He revealed for the first time that in preparation for a spectacular growth in the years ahead, Case Company had spent $28,000,000 on engineering, product development, and tooling in just the last three years. Said Mr. Rojtman, "We have a deep reservoir of new product strength that has not yet become apparent, and that will be coming off the assembly line from now until 1964."

He believes that "barring unforeseen circumstances," 1960 will again, for the third year in a row, break the company's 117-year sales record. Mr. Rojtman predicted that the Case Company, with its phenomenal growth from $87,000,000 in 1956 to $200,000,000 in 1959, would continue its progress in the 1960's, particularly in construction, roadbuilding and materials-handling equipment, through its world-wide manufacturing operations.

Marc B. Rojtman, J. I. Case Co. president, beside a new Case diesel engine, just introduced in the company's wheel and crawler tractors, to furnish competition for European imports.

David A. Milligan (at wheel), vice-president in charge of sales for J. I. Case Company's Industrial Division, points out details of the firm's giant W-12 four-wheel drive loader, just introduced to dealers at the company's 1960 World Premiere in Bal Harbour. Watching are four Case division sales managers (left to right): George Novlan, Canadian Industrial Div.; Don Mitchell, Eastern Industrial Div.; Al Light, Western Industrial Div.; and Jim Cody, Midwestern Industrial Div.

Standard Slag Buys Control Of Cleveland Builders Supply

Standard Slag Company, Youngstown, Ohio, recently acquired 92 percent of the outstanding stock of Cleveland Builders Supply Company, a manufacturer and supplier of concrete products, clay brick, and other building materials in the Cleveland area.

Cleveland Builders will be operated as a separate enterprise and will expand its manufacturing and wholesaling departments, develop new products, and increase sales to small suppliers. It also will take over the retail operations of Goff-Kirby, a subsidiary of Standard Slag, which specializes in dealer sales and stevedoring in Cleveland.

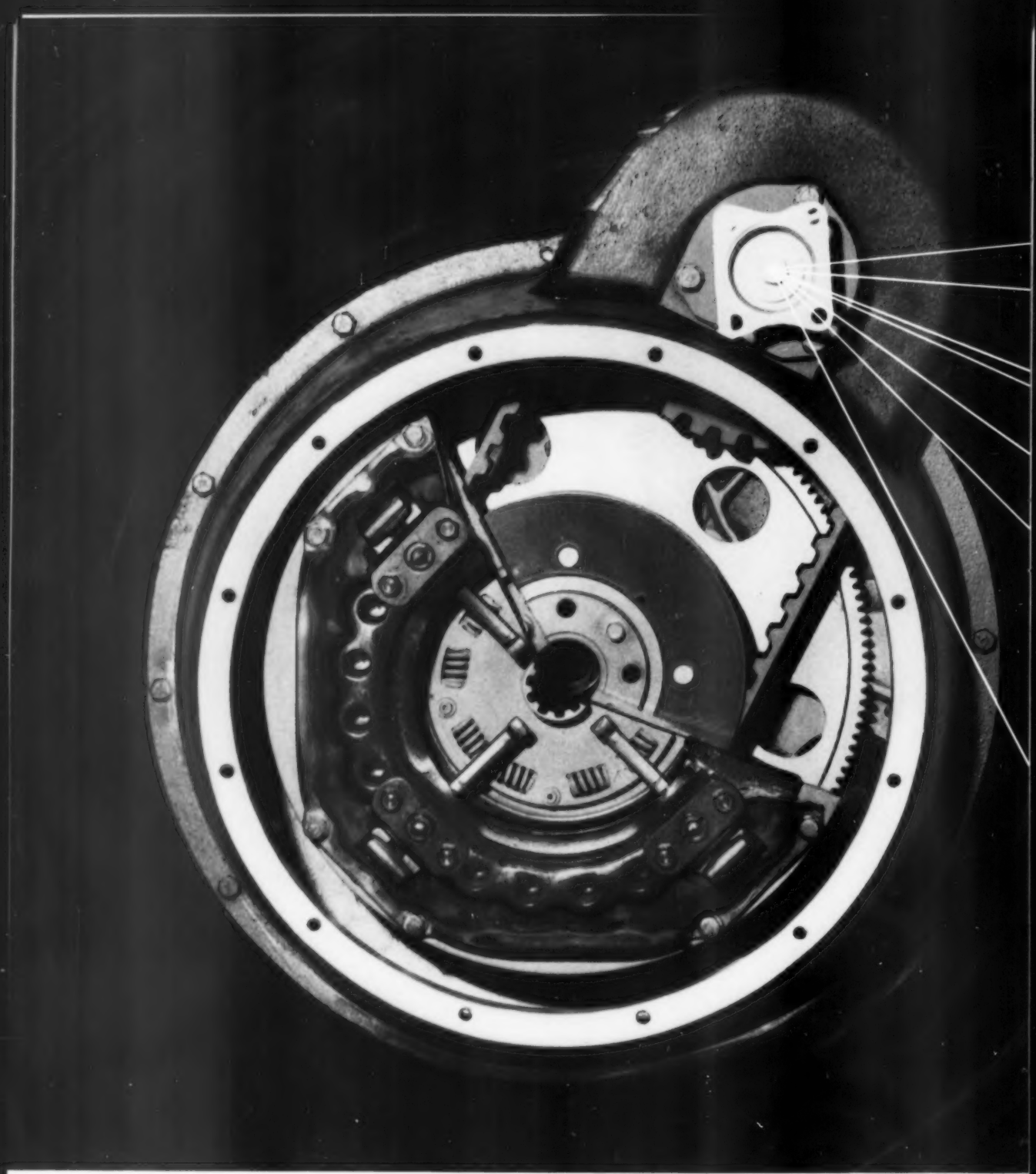
BAG DAMAGE ENDS... *when you use multiwalls made of* CLUPAK* *extensible paper!*

NEW, TOUGHER KRAFT SOLVES BREAKAGE PROBLEMS

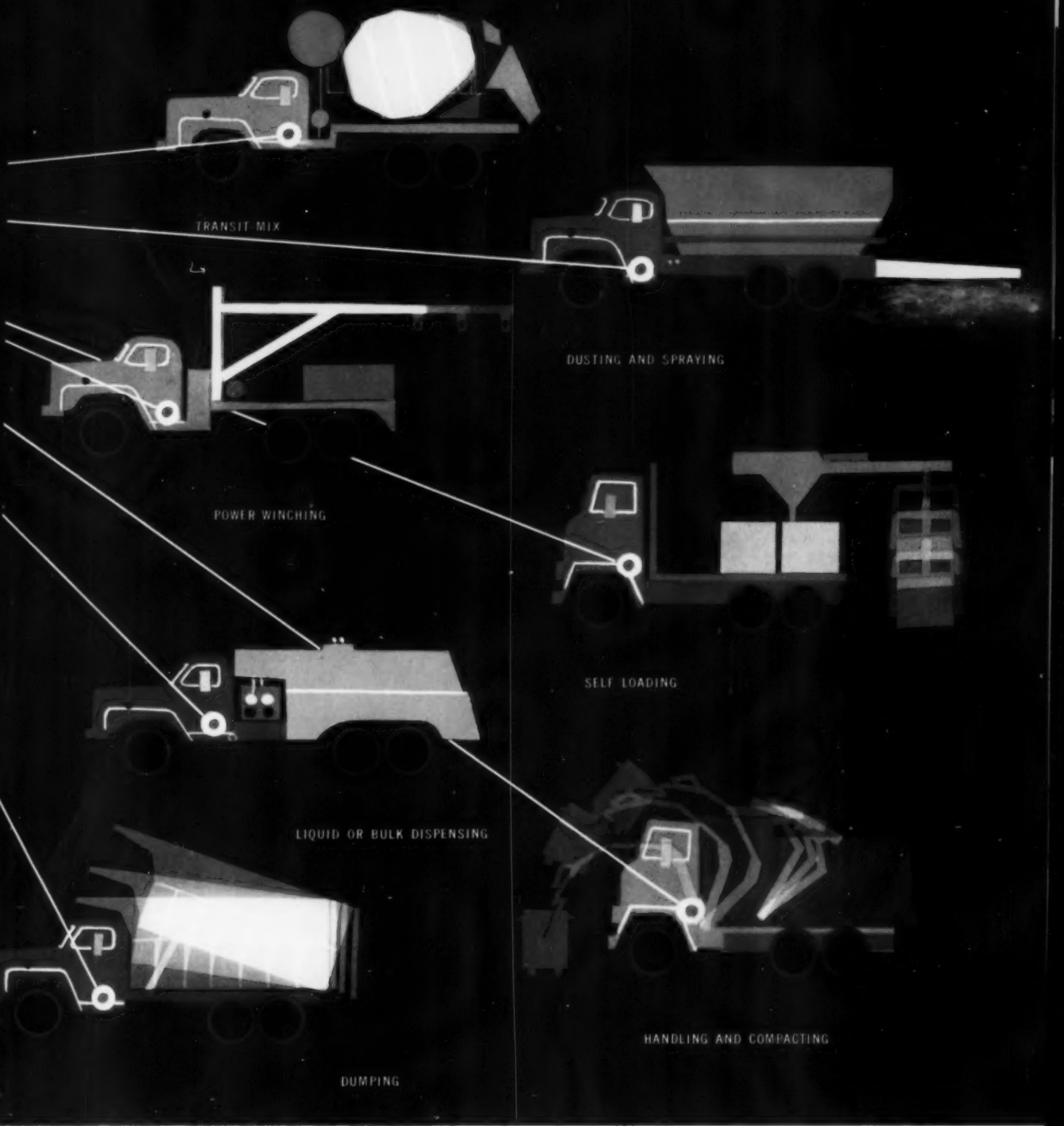
New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK in your kraft bags, you solve your breakage problems once and for all. Multiwalls of CLUPAK fill faster, palletize better and handle easier. For special handling problems, CLUPAK can be supplied with a rough outer-sheet to provide far better anti-slide protection for your product.

Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK, as part of your next bag order. See the difference for yourself. Your customers are sure to like the extra service of a better, more dependable bag . . . and so will you.

*Clupak, Inc's. trademark for extensible paper manufactured under its authority and specifications. Clupak, Inc., 530 Fifth Avenue, New York 36, N. Y.



REO



Reo's compact Flywheel P.T.O.—proven in transit-mix operation—
is now available *as an integral part of the chassis engine drive*
in custom Reo vehicles for a host of specialized uses. Perhaps yours.

If you have a power take-off application, contact your Reo representative.

REO DIVISION, The White Motor Company, Lansing, Michigan.

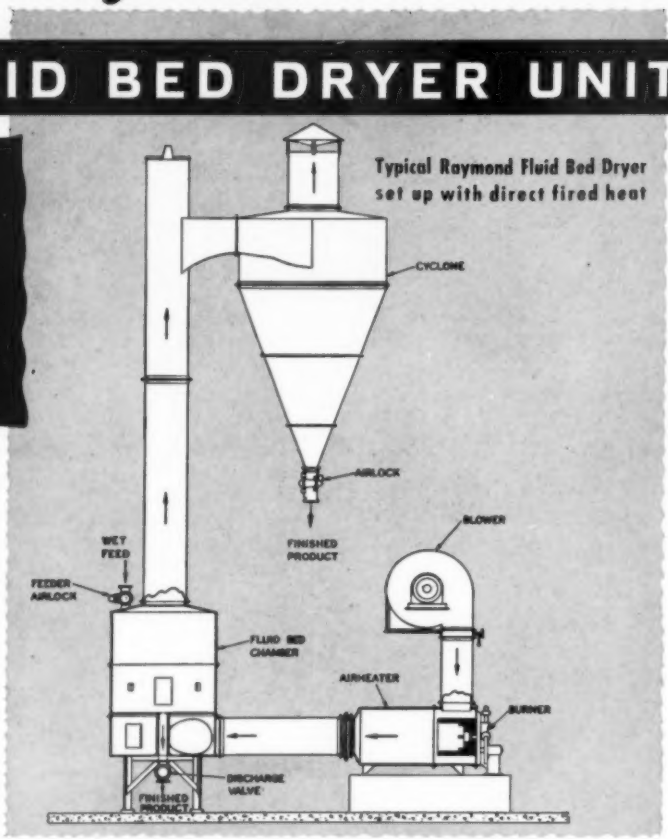
Gold Standard of Values

Note this NEW Raymond

FLUID BED DRYER UNIT

Recent addition to the Raymond line of Drying Systems.

Now available for the processing of various special products.



Typical Raymond Fluid Bed Dryer set up with direct fired heat

PRINCIPAL ADVANTAGES

1. High thermal efficiency
2. Small space requirements
3. Absolute minimum of moving parts (none in high temperature zone) helps to reduce maintenance
4. Gentle handling gives minimum degradation
5. Permits some degree of particle size classification
6. Accurate control of final H_2O
7. Continuous, automatic, dust-free operation

You will want to read about this new process.

WRITE FOR RAYMOND BULLETIN **eighty-eight**

Raymond started development work on the Fluid Bed type of dryer in 1950 as a complement to the well known line of Flash Drying Systems.

This broadened the range of dryers for handling problems where a very minimum of crystal breakage is required, as well as in processes where appreciable retention time is desired.

The first commercial size Raymond Fluid Bed Dryer was installed in 1953 on a problem requiring minimum crystal breakage. Since then, additional units have been installed by themselves or in conjunction with Flash Drying Systems.

Salt, gilsonite, synthetic resins and organic crystals are being handled in these units. Successful test work has been conducted on a variety of other materials.

With the broadened line of drying units now available, it is even more important to consult Raymond engineers when your drying problems come up. A Raymond Fluid Bed Dryer or a Flash Dryer could well be the best solution to your problem.

COMBUSTION ENGINEERING, INC.

Raymond Division

1122 W. Blackhawk Street
CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

• This dramatic photograph was taken at the Chicago Heights plant of the American Manganese Steel Division of American Brake Shoe Company. Seen through the shell of a 10-in. centrifugal dredge pump (cast in abrasion-resistant HC-250 alloy), workmen are finishing the rough casting for a 12-in model poured in austenitic manganese steel. The former alloy is specified where conditions of extreme abrasion exist, while the latter is used for heavy impact pumping.

Washington Newsletter

(*Continued from page* 11)

those paid in the continental United States.

This problem of foreign competition is not, of course, limited to the textile industry. It spreads through a large number of industries and has even begun to influence those that have been regarded as almost American monopolies. The most dramatic evidence of this is found in the automobile industry where the output of European automobiles, as recently as ten years ago, accounted for less than 15% of the total world market, but in 1960 will account for half the market. Thus, the U. S. automobile manufacturers will probably have lost their lead. Such a development is truly monumental.

The other inhibiting factor in the expectation for an unprecedented boom in 1960 is the fear that inflationary forces may become too strong. Accordingly, it is expected that in the exercise of its regular stabilizing function, the Federal Reserve Board will again try to influence the granting of credit—thereby cutting back an inflationary over-expansion.

In 1960 this task may become very difficult because interest rates are already at an almost unprecedentedly high level. In many states, the rate of interest being charged is at, or very close to, the legal ceiling under the usury laws. The Federal Reserve Board has other methods for accomplishing its objectives, such as dealing in open market operations, and raising the legal reserve requirements of its member banks. Both of these actions will probably be taken if, in the judgment of that Board, the boom looks as if it might get out of hand. This, of course, is a "good" kind of trouble. The reverse would be much more serious; namely, if the problem were how to get a boom going.

The consequence of this buoyancy in the economic field has been a real bouyancy in the political atmosphere of Washington. Not for many years have the representatives of the Republican administration looked quite so confident as they do now.

Labor Developments

(*Continued from page* 13)

reasons why Congress, which was under an absolute necessity to act, would be more severe on the companies than on the union. They are: (1) the fact that it is an election year, and few Congressmen, (all of whom must face the voters this year) or senators (one-third of whom will be running for re-election) would want to face those voters when they are in an angry mood; and (2) that organized labor had recently been dealt a severe blow with the passage of the Griffin-Landrum Act. Therefore, for political reasons, the legislators might regard it as wise to salve the wound by passing legislation more harmful to their industry opponents than to the unions.

But even this explanation does not appear to be the whole story. The fact of the matter is that a settlement could have been achieved long ago if the President had been willing to agree that he would not publicly chastise the companies for subsequent rises in the price of steel. Following his firm conviction that any such rise would be inflationary, and therefore detrimental to what has become his most important goal, he refused to give any such commitment.

Now, however, the situation appears to be quite different. It does not require very astute reading between the lines to note that the understanding reached either overtly or tacitly is that the steel companies will make no immediate price increase—nor that if it should develop in a month (or two or three) that a price rise is necessary to maintain a profit margin at a reasonable level, there will be no serious criticism from the administration of such a step. Preferably, such price rises will be gradual and selective, rather than across the board and dramatic.

The problem of price increases in steel is the fly in the ointment of the Nixon settlement. Should they take place, and should they be large enough to be obvious, they may well turn out to have serious political consequences. It can be expected that the Democrats will ferret out each of them and use them in their attempt to create as best they can the image of a devious Mr. Nixon.

If this is the best they can do, they will probably be ineffective. But, if this can be added to other evidence, a real dog fight appears to be in the offing. And this is why, if the election were to be held right now, there would be little question about its outcome—but, politically, November is a long way off, and almost anything can happen.

JAMES C. DEMAREST has joined Alpha Portland Cement Company as a sales representative in northern New Jersey.

- **Extreme Length Stability**
- **Eliminates Matching Problems**
- **Controlled Elasticity**
- **Greatest Over-All Strength**
- **New Super Strength Cords**
- **Oil and Heat Resistant***
- **Static Dissipating***

*Super-Thorobred V-Belts

In a storm of rock dust
that quickly cuts other V-Belts to shreds, Dayton Blue Ribbon Thorobreds and Super-Thorobreds give years of dependable, maintenance-free service. They are specifically designed to withstand heavy duty service in abrasive atmospheres.

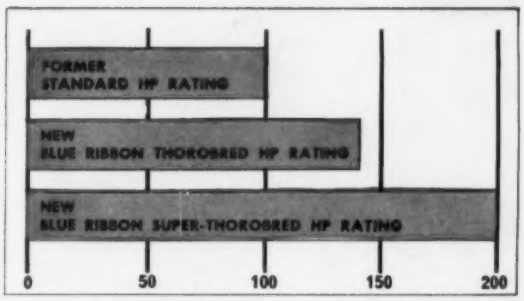
The leader in V-Belt development announces a complete ***NEW*** *line—*

Dayton BLUE RIBBON V-Belts

with important new gains in ***Thorobred*** *and* ***Super-Thorobred*** *horsepower capacity*

When you have to increase production, reduce downtime and cut costs all at the same time, the new name to remember in V-Belts is Dayton **Blue Ribbon** . . . not a redesigned V-Belt line, but a completely new approach to power transmission that only Dayton V-Belt engineers could produce.

Everything's new—from the selection of rubber stocks in the compression and tension sections to the "controllable" synthetic fibres in the strength section and the double-wrapped "High Twist" bias-cut cover that's applied relaxed for maximum give during bending. These exclusive new features give you the best all-around V-Belt line on the market today . . . at budget costs.

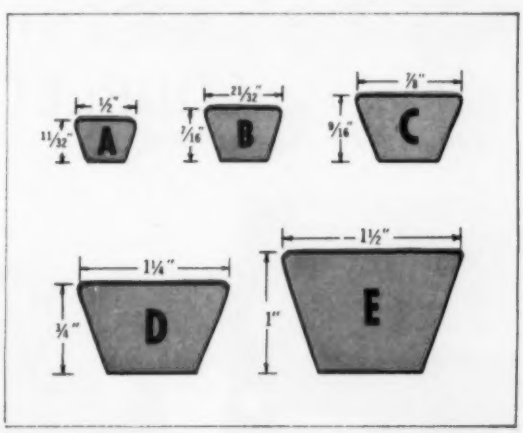


New Blue Ribbon Thorobred ratings are 40% higher than previous standard belt ratings.

New Blue Ribbon Super-Thorobred ratings are now 70% to 120% higher than previous standard belt ratings.

New Dayton *Blue Ribbon* V-Belts cut costs five ways:

1. **Prolong machine life.** Blue Ribbon Belts absorb machine killing shock loads and vibration . . . protect valuable production equipment.
2. **Reduce inventory.** Now, belts can be ordered singly or in perfectly matched sets by number alone. Each belt carries its share of the load for longer life and fewer replacements.
3. **Wider operating range.** Your present sheaves now offer a much greater range of horsepower capacities. No special sheaves required.
4. **Improved efficiency.** Blue Ribbon Belts operate at less tension, thereby increasing bearing life.
5. **Increase production.** Long Belt life means less downtime for replacement.



Blue Ribbon V-Belts are available in a full range of industry standard sizes.

Thorobred—A through E cross-section

Super-Thorobred—A through C cross-section

FOR MORE INFORMATION SEE YOUR YELLOW PAGES UNDER "BELTING" OR WRITE TO:

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INDUSTRIAL DEPARTMENT

Dayton Industrial Products Co.

Melrose Park, Ill.

A Division of The Dayton Rubber Co.

Please send me a free copy of the "Handbook of V-Belt Drive Design."

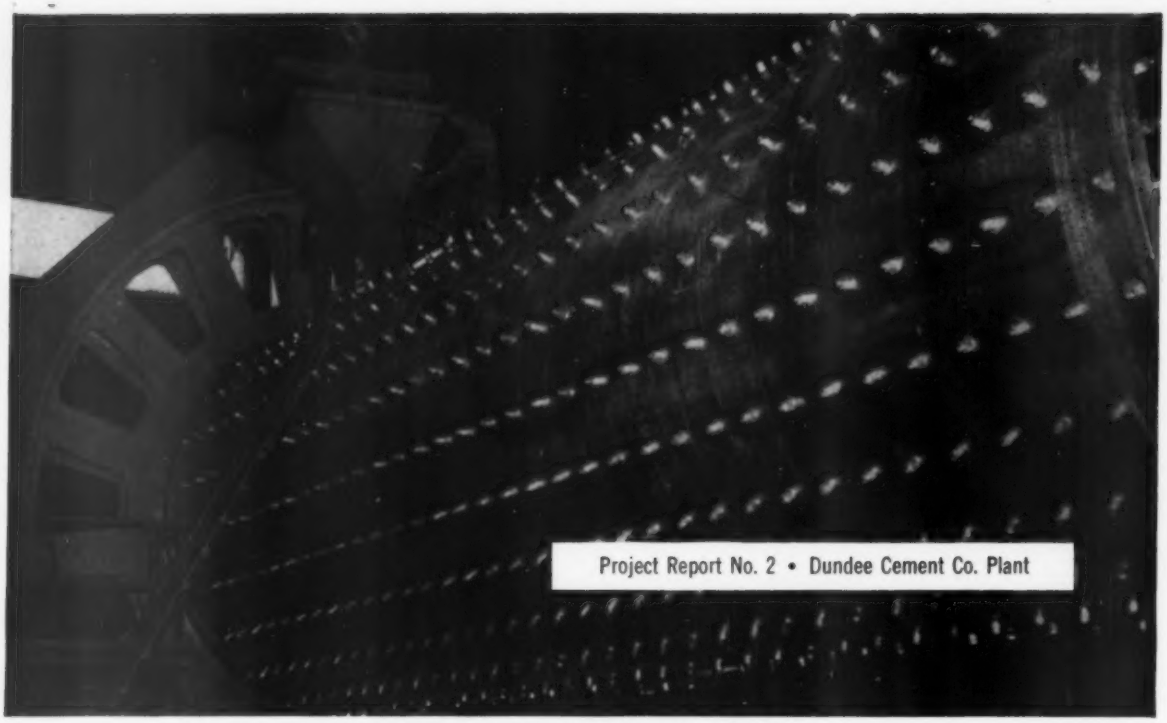
NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____



This huge Nordberg mill, 12′ x 36′, is charged with 200 tons of grinding balls.

WORLD'S LARGEST MILLS— COUPLED TO 2500-hp. MOTORS

Mills were efficiently installed with Darin & Armstrong's 100-ton crawler cranes, saving the cost of using portable A-frames.

The five mills—each coupled to a 2500-hp. motor through one of these massive gears—will produce 5 million barrels of cement a year.

Maximum unit capacity with a minimum construction cost is the principle under which the engineering division of the St. Lawrence Cement Company designed the Dundee plant.

As a result, Darin & Armstrong found itself faced with the problem of handling mills and kilns larger than any that had ever been used before.

They solved the problem with new techniques and thorough planning, and today the project is right on schedule, *without overtime.*

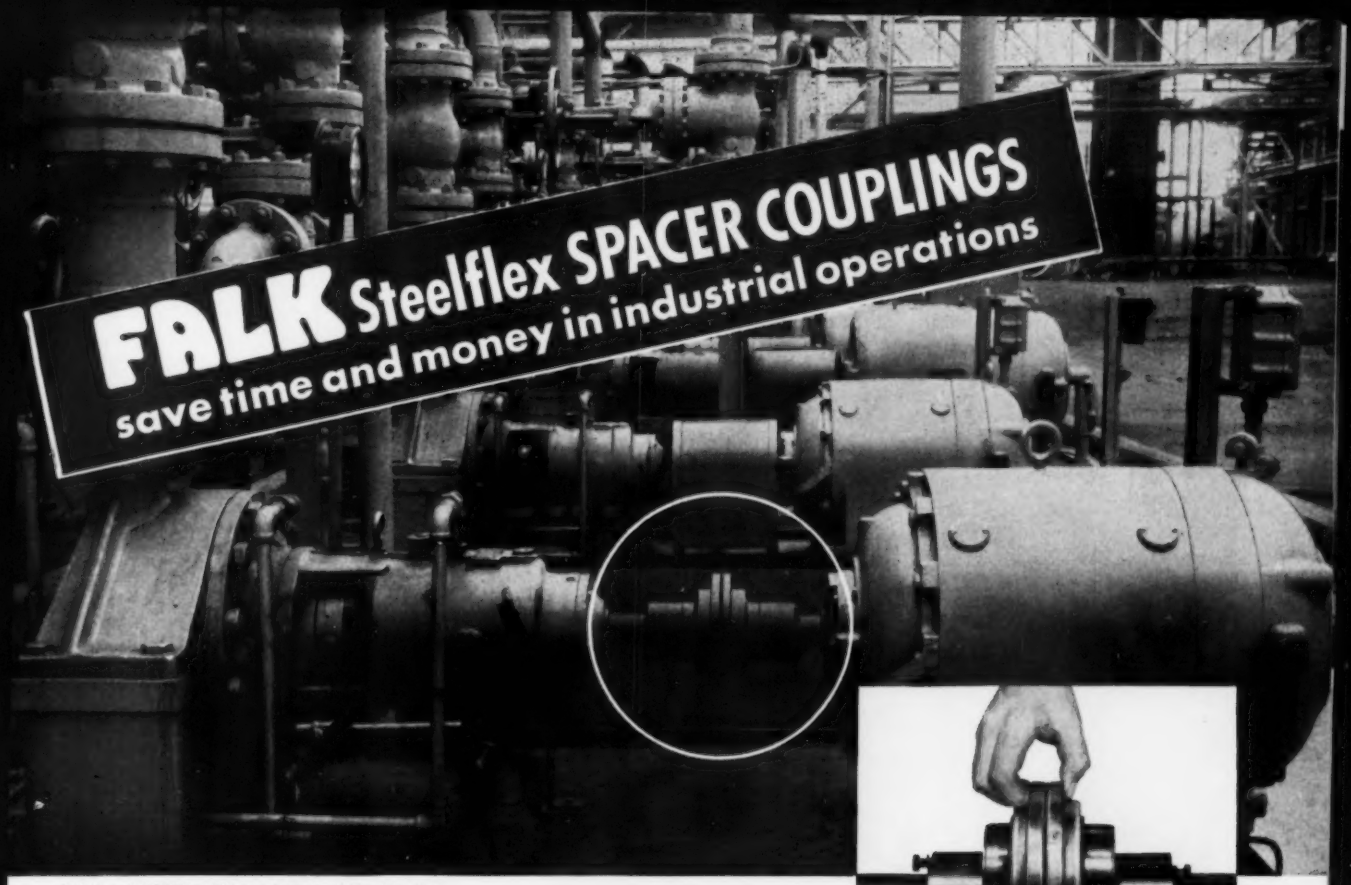
This picture report covers the mills.

(For Project Report No. 1 see Dec., 1959 issue.)

DARIN & ARMSTRONG, INC.

GENERAL CONTRACTORS

Chicago 38, Ill. DETROIT 38, MICH. Cincinnati 18, Ohio



FALK and STEELFLEX are Registered Trademarks

Cut disconnect-reconnect time by as much as 50%

The FALK Spacer Coupling is specially designed for quick installation or removal *without disturbing the driving or driven unit.* This feature can save you up to 50% in disconnect-reconnect time when critical equipment—a process pump, for example—needs repair or replacement.

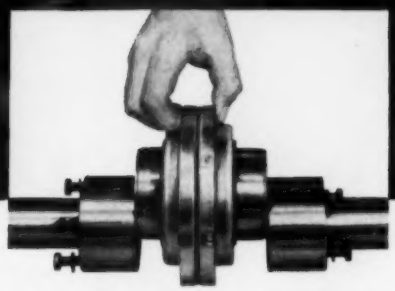
Here's another saving: with the FALK Spacer Coupling, you can quickly realign shafts *without the usual loss of operating temperature!*

And still another: you can remove or reinstall the FALK Spacer as a unit *without draining the lubricant.*

Because of its exclusive grid-groove Steelflex design, the FALK Spacer can accommodate residual misalignment—parallel, angular, or (most important) *both.* Also, it provides torsional resiliency that cushions shock and vibration. Thus it saves wear-and-tear on your connected equipment.

To prove these claims and enjoy these savings, install a FALK Spacer on one application—and see for yourself. Consult your FALK Representative or Authorized Distributor.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS
Representatives and Distributors in many principal cities.

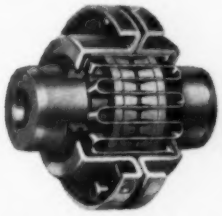


EASY AND QUICK TO INSTALL, DISCONNECT OR RECONNECT

First, mount shaft hubs to allow proper distance between hubs; then, align driving and driven units.

Second, compress Spacer to fit space between hubs and tighten cap screws to pull spacer hubs into the registered fit.

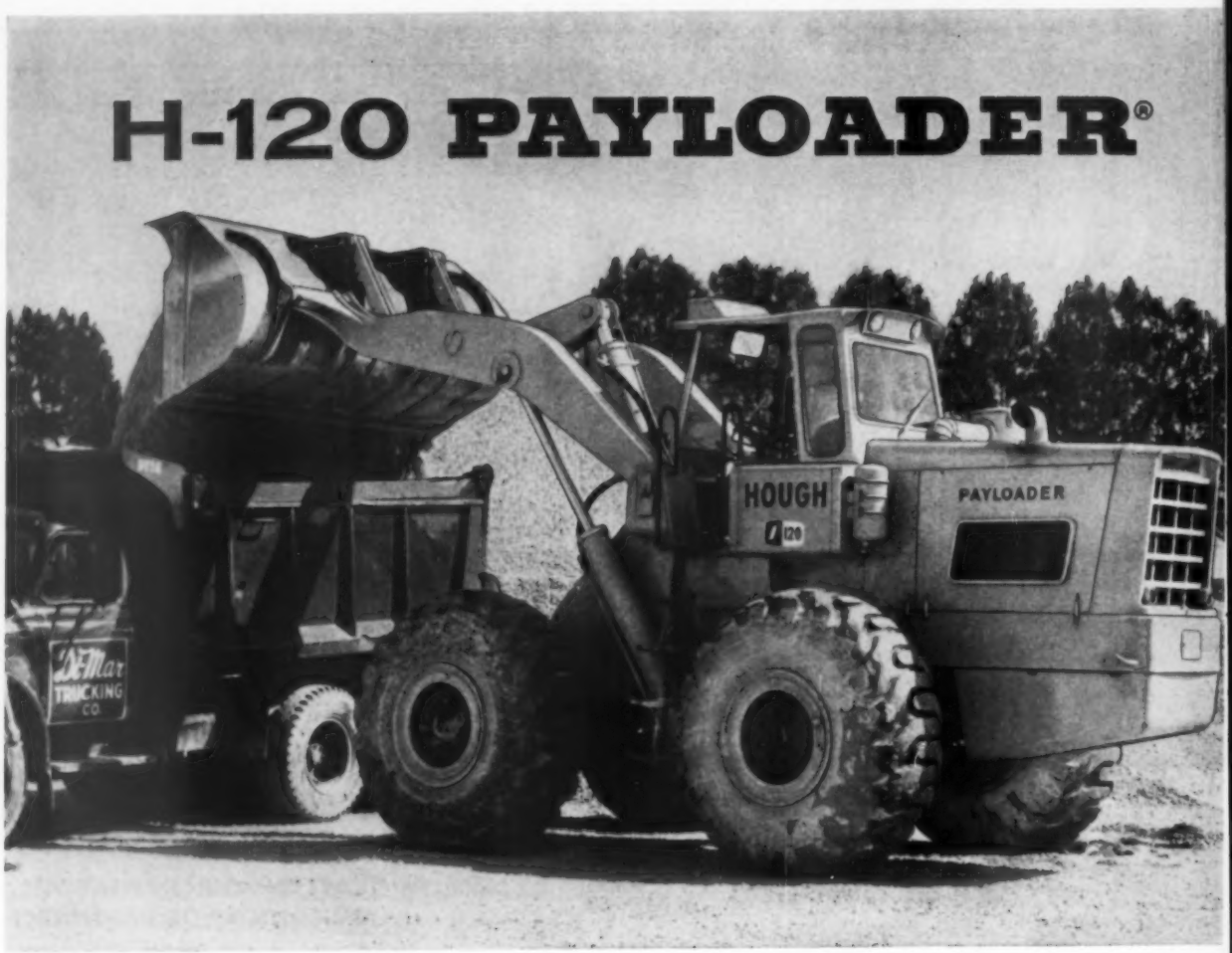
To disconnect, reverse the second step. No draining of lubricant necessary.



The heart of the FALK Spacer ...the basic Type F Steelflex
Write for Service Manual 4838

FALK
...a good name in industry

H-120 PAYLOADER®



Long forward reach (3½′ from front tires) and high dumping clearance (10′-10″ to bucket edge, dumped) enable the H-120 to load any size truck with speed and safety.

"MUCH, MUCH BETTER THAN ANY OTHER"

says Charles Serianni, President, ASSOCIATED DI-MAR INDUSTRIES

Hollywood Quarries, Inc., a division of the vast, diversified Associated DI-MAR Industries, Hollywood, Florida, is one of the major aggregate producers in the area and has the reputation of "pushing out" materials at breakneck speed. Equipment has to pay its way, or make way for newer, faster, more productive machines.

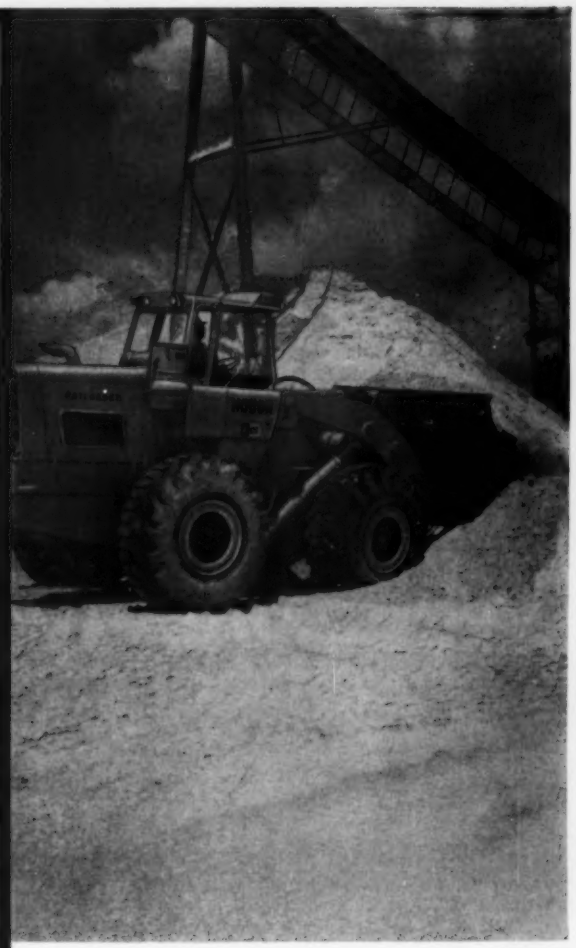
Several months ago a new H-120 "PAYLOADER" was demonstrated in direct competition with Hollywood's other loaders in the quarry. "There was just no comparison... the H-120 was a much, much better loader than anything we've ever had", said Charles Serianni. "I had to buy the H-120 in order to keep my best operator... he's really in love with it."

One of the other loaders was traded in and now the big "PAYLOADER" does as much work as two 2½ yd. loaders formerly did. Huge 23-ton trailer trucks are loaded with crushed rock or sand in less than 2½ minutes.

The long reach, high dump and full clear, visibility front and rear, makes loading fast, easy and safe. Power assist on all controls — steering, braking and shifting — reduces operator fatigue for sustained steady output all day long.

The H-120 (12,000 lb. operating capacity) is a "wonder on wheels" so it's no wonder why aggregate plants throughout the country are buying them in fleets, and setting new performance records for output and economy. If you haven't seen this remarkable new "PAYLOADER", contact your Hough dealer as soon as possible, or return the coupon for full details.

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.



Powerful traction plus tremendous break-out force gets full bucket loads quickly and easily. Bucket tips back 40 degrees at ground level.

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
750 Sunnyside Ave., Libertyville, Ill.

Send complete Model H-120 "PAYLOADER" data

Name _____

Title _____

Company _____

Street _____

City _____ State _____

2-8-4

BUELL-NORBLO
TWO GREAT NAMES
ONE GREAT LINE
OF DUST RECOVERY EQUIPMENT

With the acquisition of The Northern Blower Company, Buell can provide a broad range of products and systems for handling every industrial dust and air pollution problem. Norblo bag type collectors now augment Buell Cyclones and other mechanical collectors, electric precipitators, combination systems and centrifugal and gravitational dust classifying systems. And like Buell, Norblo has been accepted and proved through years of experience in active, on-the-job service. Thus Buell is better able to meet both standard and special requirements in fields that include the electric utilities, steel, oil, cement, chemical, paper, and other process industries. Buell Engineering Company, Inc., 123 William Street, New York 38, New York. Northern Blower Division, 6404 Barberton Avenue, Cleveland, Ohio. (Subsidiary: Ambuco Limited, 2-5 Old Bond Street, London, England)

buell
NORBLO

New Conveyor System

. . . gives far greater belt life

. . . reduces maintenance

. . . and you get it *exclusively* from McNally Pittsburg

A completely new Cradle Idler* is the key to this high-efficiency McNally Pittsburg conveyor design. By mounting new 5" rubber rollers on a *nonrotating*, stainless steel rope, dangerous harmonics and "loping" are eliminated—permitting greater capacity and faster belt travel with minimum spillage. The *true catenary* of this suspension provides uniform belt support with no bends or creases—belt life is substantially increased.

Because of the unusual simplicity of this new McNally Pittsburg conveyor design, installation costs are lower—and maintenance costs are at a minimum.

* Patents Pending

New shock absorbing 5" rubber rollers have precision ground ball bearings, prelubricated and lifetime sealed.

With true catenary suspension, belts stay flat; support is uniform under all conditions for far longer belt life.

On-the-job construction is simple. The entire conveyor uses standardized components for easy assembly to fit your particular needs.

WRITE TODAY for details on this new McNally Pittsburg conveyor which costs less to install . . . saves money every day it is in use.

McNALLY PITTSBURG

McNally Pittsburg Manufacturing Corporation—
Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering and Sales Offices: Chicago • Rio de Janeiro
Pittsburg, Kansas • Wellston, Ohio

McNally Pittsburg Mfg. Corp.
Dept. P
Pittsburg, Kansas

☐ Please send information on the new McNally Pittsburg belt conveyor.

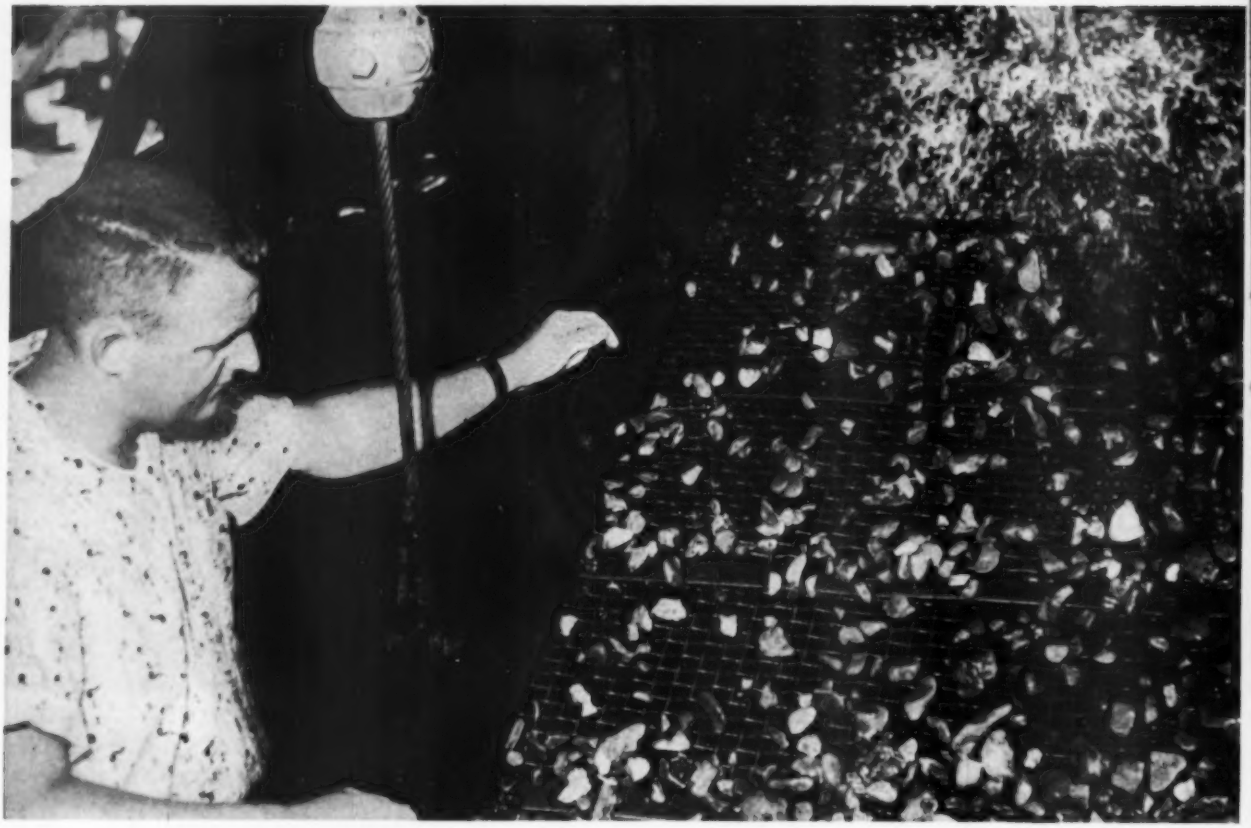
☐ Have Sales Engineer call for further consultation.

Name_____ Title_____

Company_____

City_____ State_____

There's a CF&I Space Screen for



Greenville Gravel Company reports...

"CF&I Super-Tempered Space Screens are extra tough, give 50% longer life"

"During the eight years we've used them, **CF&I Super-Tempered Space Screens have consistently delivered up to 50% longer service life than other screens we've tried,"** says Mr. W. E. McCourt, president of the Greenville Gravel Co., Greenville, Miss., operator of the largest sand and gravel plant anywhere on the Mississippi River.

"We handle more than 150 tons an hour of crushed gravel dredged from the river bed, averaging a high 2.68 on the hardness test scale. In addition, we have to contend with a 7-1 proportion of sand entering our screens. Because of this brutal punishment, we need the very toughest and most abrasive-resistant screens available. Only CF&I Screens really measure up to these requirements."

CF&I Super-Tempered Precision Space Screens are made from oil-tempered, high-carbon steel in a wide selection of dimensions, weaves and edges. For space screens that hold cost-per-ton to a minimum, CF&I is the buy. Mr. McCourt speaks with authority when he says, "We have every reason to believe, on the basis of our own experience, that CF&I Super-Tempered Space Screens make good sense for any efficiency-minded concern in this industry."

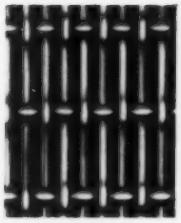
EVERY screening requirement

The experience of Greenville Gravel Co. is just one of many being repeated wherever screening operations are required. Whatever the conditions, CF&I offers space screens that will give the service you demand. This ability to satisfy your individual requirements is another of the meanings behind the Image of CF&I.

Super-Tempered wire is only one of the many types CF&I produces for weaving into space screens. CF&I also offers Wissco-Loy Precision Space Screens. Made from special alloy wire, these screens are designed and manufactured for lowest cost-per-ton screening. In addition, CF&I makes screens in carbon, alloy and stainless steels, manganese, aluminum, brass, copper, and Monel.

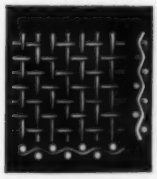
CF&I Screens are produced in a great variety of weaves, crimps and edge preparations. For long screening life, CF&I uses heavy wires, creating a relatively small open area. Screens for high-speed operation are made from thinner wire. Other screens are built to give a good balance between speed and long life. CF&I Space Screens are made from wire in diameters from .035" to 1", with openings from .063" to 6".

For complete information, get in touch with your local CF&I sales office, or write and ask for our folder on Super-Tempered and Wisscoloy Precision Space Screens (MS-675).

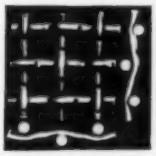


Rectangular Opening screens for maximum through capacity

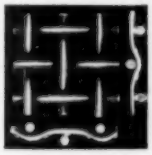
Long Slot screens for freedom from clogging



Double Crimp screens for long life under tough operating conditions



Lock Mesh screens for maximum accuracy



Flat Weave screens for minimum resistance to material flow

Hooking and Edge Preparations

Wrap-Around Hooked Edge (with or without) canvas, wire cloth or steel reinforcement)	Plain Hooked Edge (with steel wear strip)	Round Mild Steel Edge (wire woven in and welded)	Square Mild Steel Edge (bar welded on fabric)	Knuckled Edge	Turned Edge (plain hook)	Prefabricated Steel Angle (welded on fabric)

CF&I SPACE SCREENS

THE COLORADO FUEL AND IRON CORPORATION

In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise Butte • Denver • El Paso • Farmington (N. M.) • Houston • Ft. Worth • Lincoln • Los Angeles • Oakland Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle Spokane • Wichita

In the East: WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit New Orleans • New York • Philadelphia

CF&I OFFICE IN CANADA: Montreal

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

7352

FROM BLUEPRINT TO

Cyanamid helped Idaho Portland shoot 900,000 tons of limestone in

LOADING DETAILS

LEFT

#1 — 2,900 lbs. 60% Ammonia Dynamite
5" x 25 lbs., 26,100 lbs. Accomite.*

#2 — 2,000 lbs. 60% Ammonia Dynamite
5" x 25 lbs., 18,000 lbs. Accomite.

#3 — 2,200 lbs. 60% Ammonia Dynamite
5" x 25 lbs., 19,800 lbs. Accomite.

TOTAL 71,000 lbs.

RIGHT

#1 — 2,600 lbs. 60% Ammonia Dynamite
5" x 25 lbs., 23,400 lbs. Accomite.

#2 — 2,300 lbs. 60% Ammonia Dynamite
5" x 25 lbs., 20,700 lbs. Accomite.

TOTAL 49,000 lbs.

TOTAL 120,000 lbs.

LOADING TIME

24 hours (Three 8-hour shifts)

*Trademark

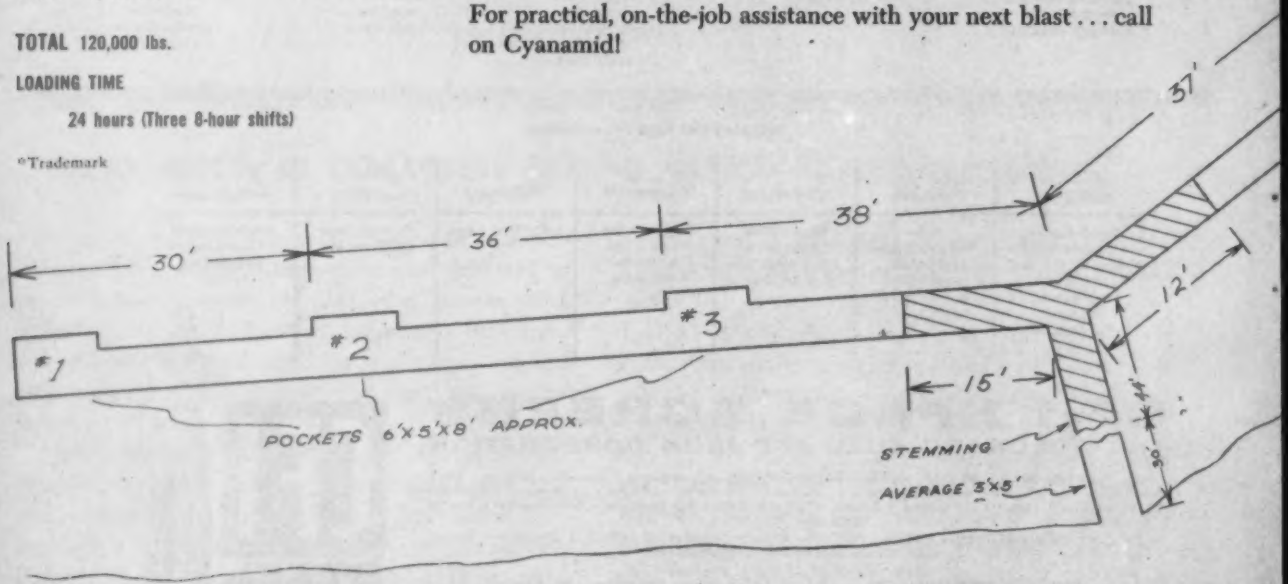
Site: Idaho Portland Cement Quarry at Inkom, Idaho.

Results: Nearly 900,000 tons of cement rock blasted with 120,000 pounds of Cyanamid explosives and blasting agents . . . a large, successful quarry blast fired at a powder factor of 7.5 tons of limestone per pound of explosives.

Working closely with Idaho Portland personnel, Cyanamid explosives engineers helped determine from contours and geology the proper location and tunnel depths for the most effective coyote shot. They helped calculate the size and disposition of the charges for maximum blasting efficiency. And, when explosives arrived from a nearby Cyanamid plant, our explosives engineers were on hand to supervise charge placement.

An unusual operation? Not for Cyanamid! This assistance, delivery and result typifies the service received by Cyanamid customers everywhere.

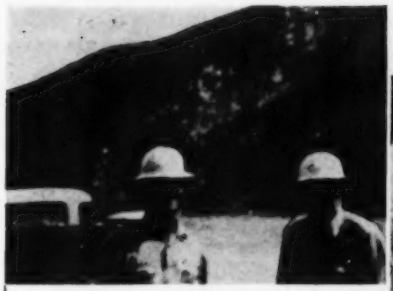
For practical, on-the-job assistance with your next blast . . . call on Cyanamid!



Enter 84 on card, page 169

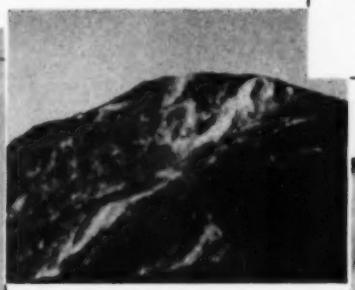
BLAST...

Cement Company a single blast

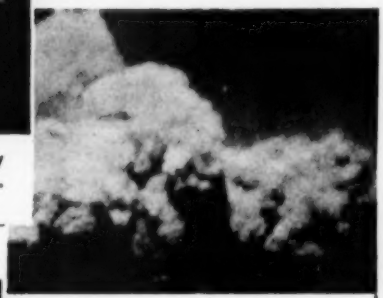


1. Cyanamid explosives engineers and Idaho Portland Cement engineers study the job geology, work closely together in planning explosives pattern and executing successful shot.

2. Engineer makes final electric blasting cap connection to primacord. A total of 12,000 pounds of Cyanamid 60% Ammonia Dynamite and 108,000 pounds of Accomite were used.

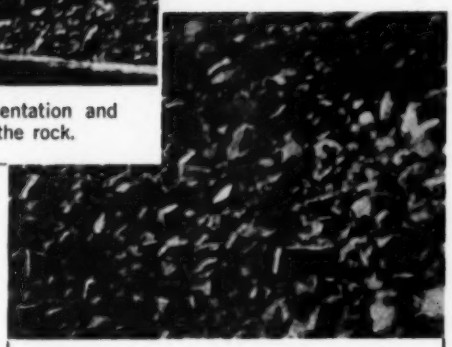


3. Idaho Portland Cement Quarry at 9:52, August 14, 1959... minutes before the blast.

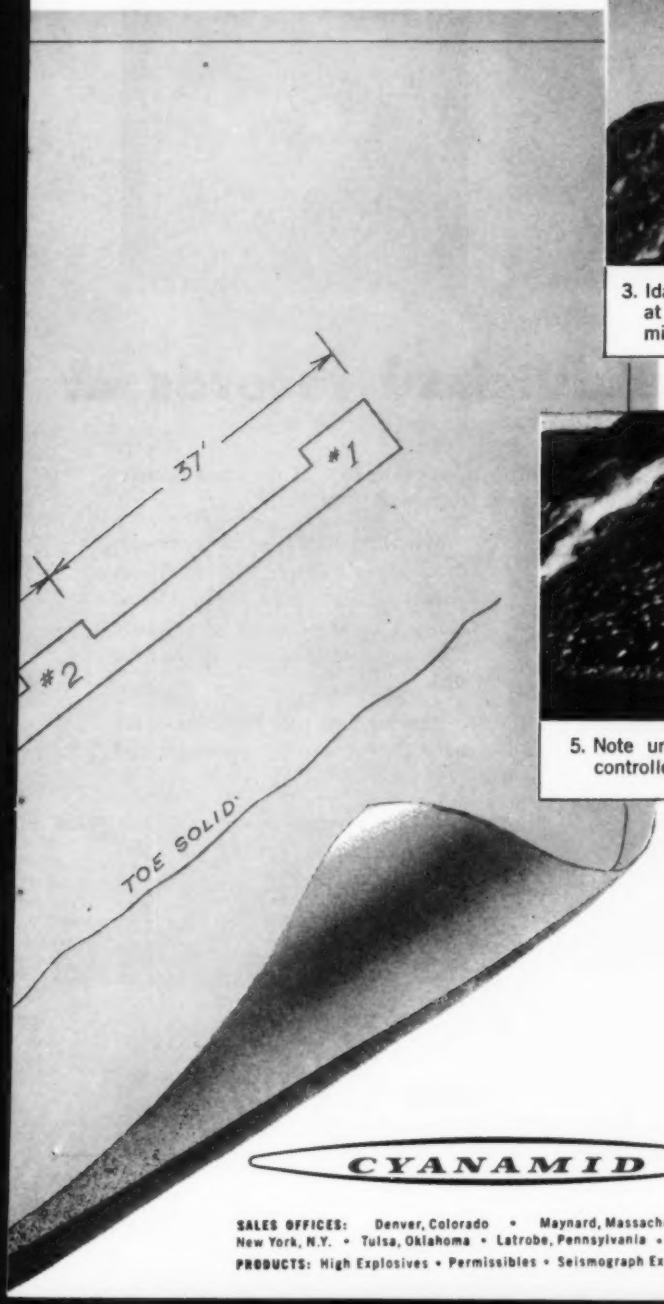


4. The blast! Time is 10:01 A. M., August 14, 1959.

5. Note uniform fragmentation and controlled throw of the rock.



6. Perfect breakage for loadability!



CYANAMID

AMERICAN CYANAMID COMPANY

EXPLOSIVES AND MINING CHEMICALS DEPARTMENT

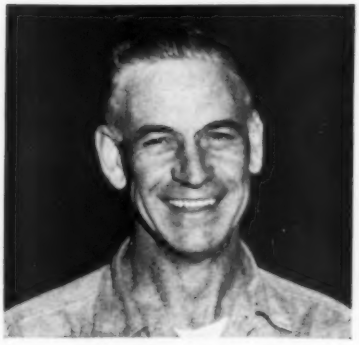
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

SALES OFFICES: Denver, Colorado • Maynard, Massachusetts • Kansas City, Missouri • St. Louis, Missouri • Albuquerque, New Mexico New York, N.Y. • Tulsa, Oklahoma • Latrobe, Pennsylvania • Pottsville, Pennsylvania • Dallas, Texas • Salt Lake City, Utah • Bluefield, West Virginia

PRODUCTS: High Explosives • Permissibles • Seismograph Explosives • Blasting Agents • Blasting Caps • Electric Blasting Caps • Blasting Accessories

Above: Beyer's President Louis Marino.

Below: General Superintendent Alva Hill.



Deister Screens set endurance records at

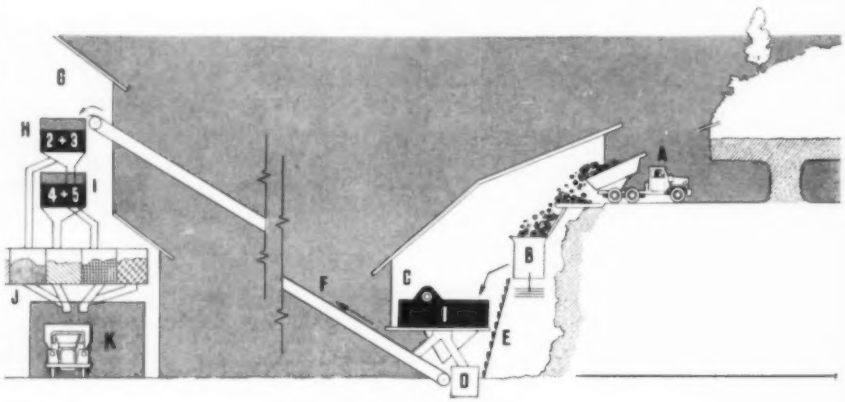
"If I had to order a thousand screens at a time, they would all be Deisters." These are the words of Alva Hill, and Mr. Hill can speak with authority. He's General Superintendent at Beyer Crushed Rock Company of Kansas City Mo., where six Deister Horizontal Screens are doing full-time duty.

Under the able guidance of President Louis Marino, Beyer has built a thriving business from its 640-acre holding. The company produces 2700 to 3000 tons of high grade limestone a day in sizes from 1" down. This is an unusual operation in that all quarrying is done underground. Openings blasted into a 23 ft. seam eventually form caverns half a mile long as the rock is removed.

How Beyer processes rock. Front end loaders haul the mined rock to dump trucks (A) which dump directly into the primary crusher (B) located 200 feet from the quarry. A double-deck 5x16 Type UF Deister Horizontal Scalper (C) handles about 340 tons of crushed rock per hour. Oversize from the two decks is gravity fed through two secondary crushers (D) and recirculated through the scalper by means of two bucket conveyors (E). It is estimated that up to 40% of the stone is recirculated over the scalper.

Material under 1" passing through the scalper's lower deck is transported on a 30" belt conveyor (F) to a screening tower (G) where four 5x16 horizontal Deisters separate the sizes.

The topmost pair of screens (H) have 1", ¾" and ½" openings, and



Schematic plant layout of Beyer Crushed Rock Company. Details are given in text above.

stone from each of their three decks is chuted to storage bins as finished material. Sizes under ½" drop to the other two screens (I), both of which have ⅜", ¼" and ⅛" openings. Finished material from these decks is also chuted directly to the storage bins (J). These ten bins, which cover a 50x100 ft. area, discharge through gravity chutes into a truck loading tunnel (K).

"Over a million tons of stone . . . not one minute's trouble." Concerning the performance of the five new horizontal Deister Screens, Superintendent Hill, who has been responsible for plant design and production since the quarry opened twelve years ago, says: "In two years time, they've handled over a million tons of stone. Outside of minor adjustments at the time of installation, we haven't had one minute's trouble. Screen cloth life has been unbelievable — two ⅛" dust and one ¼" buckshot cloths are all that we've had to replace."

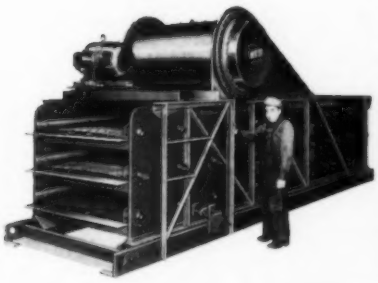
It is worth noting that Deister Screens had been used for eight years at Beyer prior to the installation of these five new horizontal Deisters in 1957. Two three-deck, 4x12 inclined Deisters were purchased in 1949 and another identical pair added a year later.

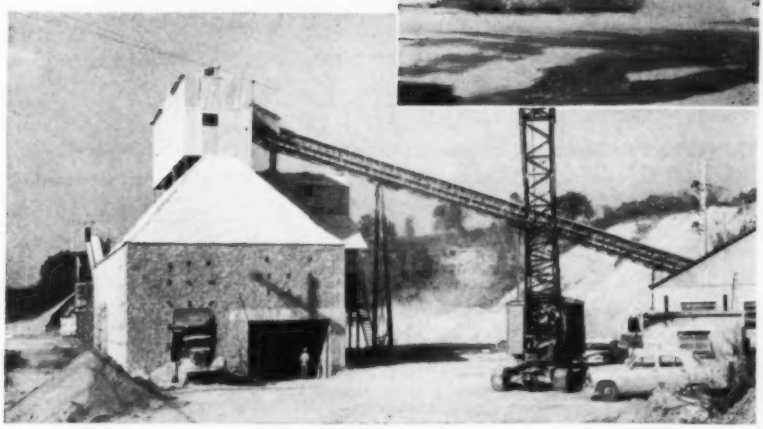
According to Mr. Hill, all 4 units "operated perfectly from the day they were installed. The first pair had no repairs except one spring although they handled at least 5 million tons and the only repair on the other two was one bearing replacement."

With this kind of service experience, it's little wonder that Mr. Hill specified Deister Screens when Beyer Crushed Rock Company converted to horizontal screening. Nor is it hard to understand why the company is "100 per cent sold on Deister."

Eight-ton dump truck hauls rock from the underground quarry to the crusher plant. This is one of nine trucks used for this purpose. They were rebuilt to Beyer's own specifications in their own shops during the slow season.

Beyer Crushed Rock





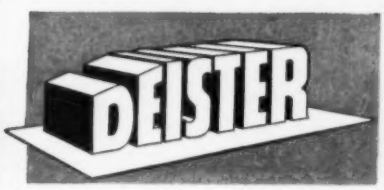
For left: In plant modernization programs the Deister Type UF Horizontal Screen is widely used to increase capacity where headroom is at a premium. Write for Bulletin 57 describing the Type UF and other screens in the complete Deister line.

Near left: This conveyor, 460 feet long, carries stone from the scalper to screening tower where four Deister Three-Deck Horizontal Screens do the fine grading job.

Bottom left: Overall view of Beyer's crushing and screening plant which processes 2700 to 3000 tons of limestone daily. Plant's remarkable efficiency is due to Superintendent Hill's efficient design and in large part to the maintenance-free performance of the vibrating screens. All screens at Beyer are Deisters.

DEISTER MACHINE CO.

1933 E. WAYNE STREET • FORT WAYNE, IND.

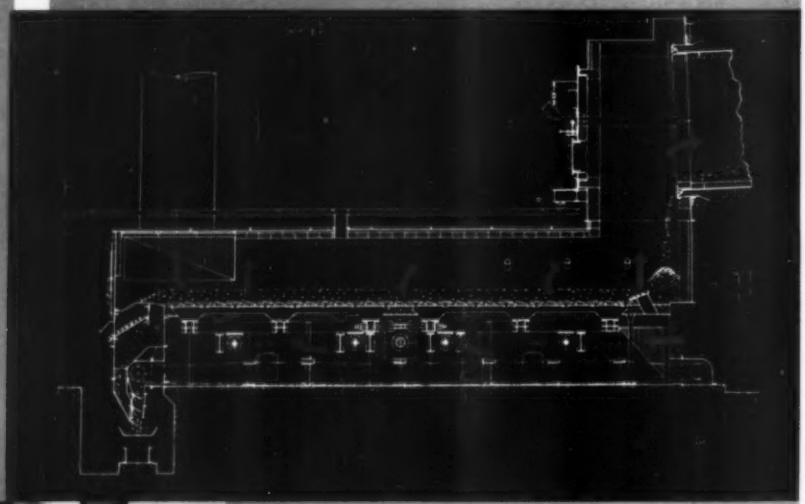


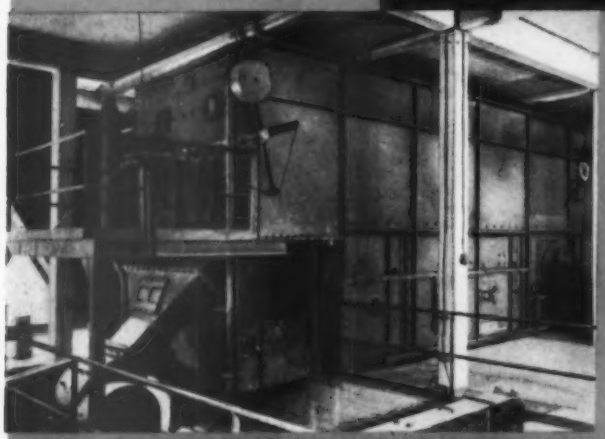
Smidth

FOLAX

HORIZONTAL GRATE COOLER

FOR CEMENT CLINKER





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The Editor's Page

Foreign Competition—A Growing Problem

WITH the steel strike over, business activity and industrial production are expected to soon reach their earlier peaks and then to continue on upward in the manner to which we have become accustomed. The prospects for the immediate future are unquestionably bright, but there are a number of very disturbing factors which make the more distant future seem much less attractive. These include the increasing ability of foreign countries to manufacture competitive products at lower prices, and the rapid depletion of our natural resources.

THE disagreeable truth is that this country is rapidly pricing itself out of markets. According to a recent article in *U. S. News and World Report* it is becoming increasingly difficult to ignore the growing problem of business competition from other countries. Foreign imports are increasing steadily and these products are being sold for less than comparable products manufactured here. This is competition from free, friendly nations, and we still have ahead of us the full impact of Communist competition with its complete control of production, wages, prices, etc.

One of the chief reasons for our predicament is that industry, especially big industry, has given in too easily to labor's constant demands for higher and higher wages, thereby keeping the wage-price spiral going ever upward. The steel industry recently put up a gallant fight but it is doubtful that anything was gained by anyone. Wages again went up, but the industry is practically assured of uninterrupted production until the present contract with the union expires. During the strike period, however, foreign lower-priced steel and steel products got an even better foothold and are now serious competition in this country.

IN THE mining industry the actual or potential increase in the productivity of foreign labor and the lower wage rates are creating a serious situation. In mineral products only two competitive weapons are available—low price and high quality. Our reserves of high-grade ore are rapidly being depleted, and we are becoming more and more dependent on low-grade reserves or on imports. According to *Mineral Industries* "it can no longer be expected that petroleum products, coal, steel, nonferrous metals, alloys, or finished nonmetallics will be better prepared, refined or alloyed in the United States than those produced in the future by foreign mineral processing plants."

WHETHER our problems can best be solved by a protectionist policy with its inevitable loss of foreign markets and the probable decline in our standard of living, or by a policy of free trade with its attendant risks, is a big question. There is no doubt, however, that we will fare much better in any case if we can check the wage-price spiral of "creeping inflation" and further concentrate our efforts on increasing our productive efficiency, and eliminating all forms of featherbedding, make work and waste. In the nonmetals field much can also be gained by using our highest quality products as much as possible only where such quality is necessary, thus eliminating costly processing and refining of inferior materials which can be used for other purposes.

Walter E. Trauffer

Modern Phoenix Plant Near 3 Million-Bbl. Glen Canyon

Northern Arizona building boom also gets assist

By HARRY F. UTLEY

ANOTHER ON THE SPOT report

IT IS seldom that a new portland cement plant goes into production with firm commitments in advance for the sale of 3,000,000 bbl. of product.

The new Clarkdale, Ariz., facility of the Phoenix Cement Company is in that rather enviable position, with about half of its output for the next four years tabbed for shipment to the Bureau of Reclamation's gigantic Glen Canyon Dam project.

Designed capacity of the new plant is 1,800,000 bbl. annually, and deliveries up to a peak rate of 120,000 bbl. monthly between now and 1964 will be required for constructing the dam and power plant.

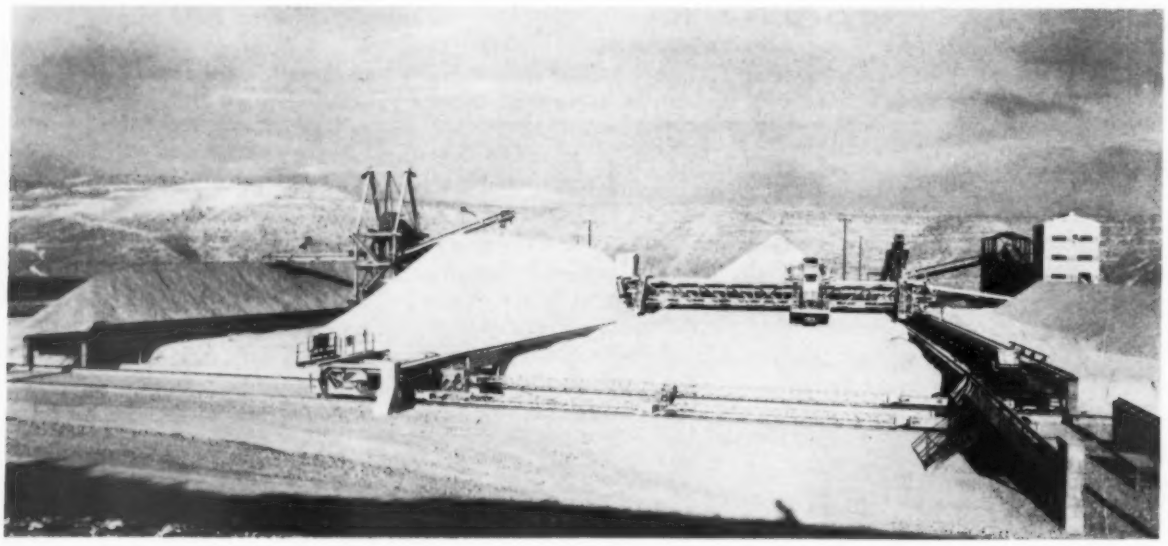
Phoenix Cement is a division of the American Cement Corporation, the fourth home-operated, autonomous division of the combine which was created on December 31, 1957, through the merger of the Hercules, Peerless, and Riverside cement companies. Like the other divisions, Phoenix operates under local management and local policy-making in all phases of its business. This organizational philosophy and application is the basic policy of the American Cement Corp., and in this respect it is quite unusual in the cement industry.

Ground for the new dry-process plant was broken in July, 1958, and the first of the two kilns was fired a little more than a year later. The Fisher Contracting Company, Phoenix, was awarded the engineering and construction contract. The contractor, in turn, sub-contracted the engineering details to the Fluor Corporation, Los Angeles. Construction of the silos went to Macdonald Engineering Company.

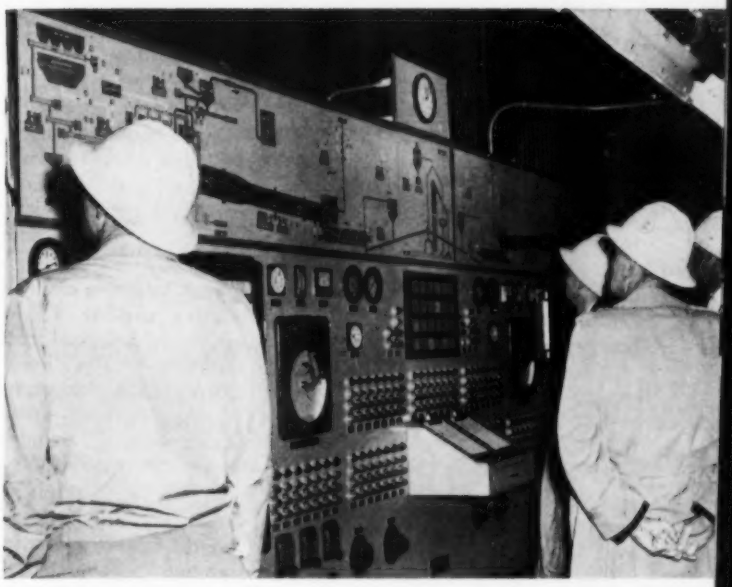
Staffs of these concerns, working closely with American Cement personnel from idea to reality, created a plant which is in every respect one of the most modern in the country. It can be easily enlarged at low capital investment at some future date, and it incorporates some noteworthy features.

Crushed raw materials are automatically sampled, stored, blended, and reclaimed by a method pioneered by American's Riverside Cement Division at Oro Grande, Calif. Clinker is stored and reclaimed in a similar manner. Final cleaning of kiln-exit gases is done in a modern baghouse

RAW-STORAGE AREA. This general view shows one of the bucket-type digging wheel reclaimers and part of the belt-conveyor stacker system.

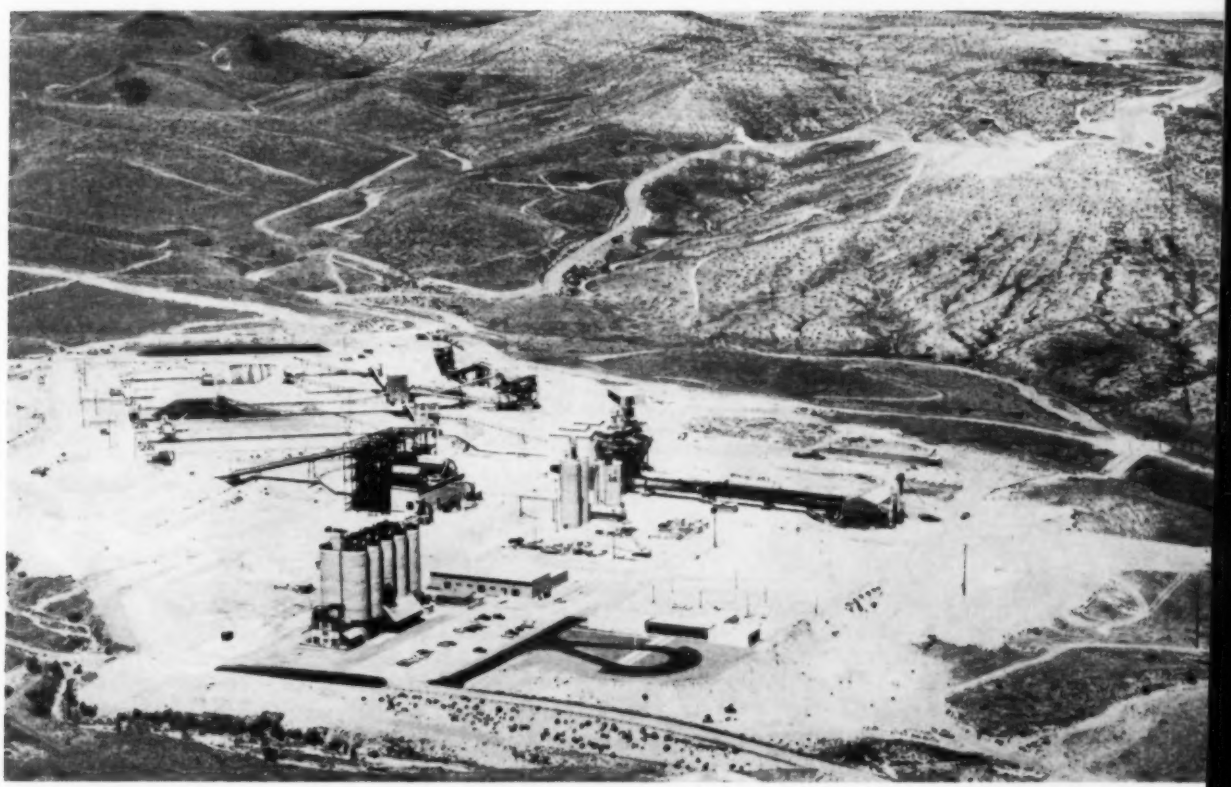


Clarkdale Supplying Dam Contract



Right:
CONTROL PANEL IN KILN CONTROL CENTER. Guests were taken on a guided tour of the new Phoenix plant during the grand opening in October. They are shown here in the kiln control center. Diagram of burning department (top) has red and green lights linked to control points, signifying proper operation or trouble. The large panel below holds dials, lights, controls, and other instruments for control of the kilns.

Below:
AERIAL VIEW of Phoenix Cement Company's new 1,800,000-bbl. dry-process plant at Clarkdale, Ariz. The crushing and blending-storage area is at the left in the plant area; quarries now being opened are visible at the upper right of the picture.



utilizing heat-resistant glass-cloth bags.

Two quarries have been opened in the hills about 500 ft. above the plant; one yields high-calcium limestone, the other interbedded limestone and clay. The deposits have no overburden, so no stripping is needed.

The brunt of the drilling task is borne by a 6-in. Schramm Rotadrill mounted on a Ford truck. This self-propelled rig is hydraulically operated and supplies its own air at 400 c.f.m. from a self-contained compressor. It is equipped with a rotary tool for down-the-hole percussion drilling, as well as for straight rotary work. Gardner-Denver Air Trac units are used for road and development work. After the faces become established, the quarries will be benched and definite drill patterns and blasting techniques will be formulated.

Two Marion electric shovels load the broken stone into the quarry trucks, consisting of five Euclid R26 rear-dump units. The shovels, a 4½-cu. yd. Model 112M and a 2½-cu. yd. Model 492, receive their power through Simplex trailing cables.

The Eucs discharge their 25-ton loads at the crushing department after a down-hill haul of about 2 miles. A 60-in. Universal Wobbler 15-bar feeder by-passes minus 3-in. stone and feeds the oversize to a 48- by 60-in. Allis-Chalmers primary jaw crusher. All product travels *via* a 42-in. by 210-ft. belt-conveyor to a 100-ton-capacity surge bin. De-tramp protection enroute is provided by an R.C.A. metal detector.

The level of material in the surge bin is sensed by Accuray level indicators. The Accuray device, made by the Industrial Nucleonics Company, uses atomic radiation to sense material levels within the bin. These indicators start and stop a Jeffrey Waytrol feeder under the bin which records the amount and controls the rate of flow of material onto a 42-in. by 314-ft. belt conveyor feeding the secondary crusher.

Secondary reduction to minus ⅜ in. is accomplished in a 52- by 80-in. Williams reversible impactor. A 6- by 12-ft. Hewitt-Robins Vibrex primary screen first rejects plus ⅜-in. material to the impactor mill, with two 6- by 16-ft. vibrex screens following in closed circuit with the reduction machine. The resulting minus ⅜-in. mill feed material is then conveyed to a bedded-storage area. The iron-bearing component used at the plant is copper-smelter slag obtained from an abandoned smelter site about 6 miles south of the plant. The slag is also put through the crushing circuit.

Dust arising in the crushing department is suppressed to the minimum by a Johnson-March system, which blends a chemical wetting with the spray water. Dust is suppressed at six points of emanation.

A 36-in. by 243-ft. belt-conveyor delivers the crushed raw material through a sampling station before it passes along to the layered storage area piles.

Rock sampling, stacking, and reclaiming in the storage area is almost identical with the system in use at Riverside's Oro Grande plant, except for capacity. This procedure was described in considerable detail in the July, 1959, issue of PIT AND QUARRY and will not be described here. At Clarkdale, the piles are shorter — only 300 ft. long—while those at Oro Grande are 517 ft. long. Conveying equipment has been provided for the recirculation of the raw material as a control factor to determine final mix proportions in the pile.

There are four 20,000-ton raw piles and four 40,000-bbl. clinker piles, built up by belt-conveyor stackers and reclaimed by bucket-equipped digging wheels. Recirculation of the raw material (the clinker does not recirculate) is done by a 24-in. by 444-ft. belt conveyor which can return the material to the desired pile. The reclaimers start or stop automatically, according to the level of material in the mill building feed bins. The level sensing devices in the bins are of the rotating paddle-wheel type.

At the rock-sampling station a Geary-Jennings sampler may cut a sample of the material arriving from the secondary crusher, or from the recirculating material in storage. This material is ground in a Raymond air-swept roller mill and air separator; a second sampler then cuts a final laboratory specimen.

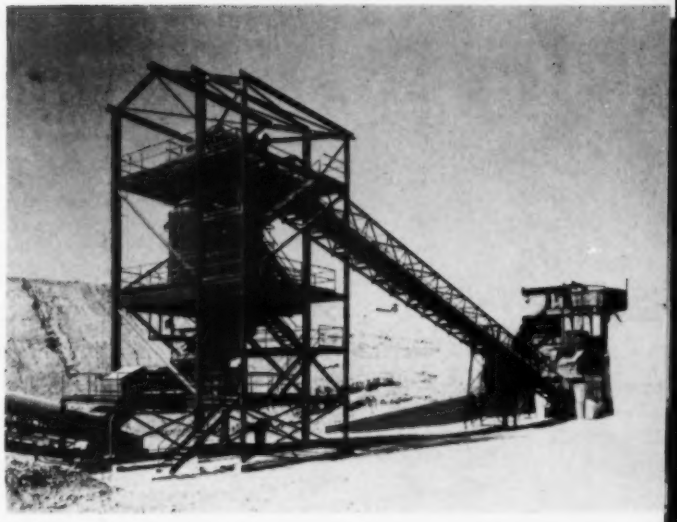
All belt-conveyors, the two stackers, and the two reclaimers were built by Hewitt-Robins. More than 14,000 lineal feet of conveyor belting was used.

The mill building houses three 19- by 12-ft. ball mills, one for raw grinding, one for finish grinding, and the

Left:
THIS TRUCK-MOUNTED DRILL is jacked up in level position to put down a 6-in. blast hole. The brunt of the drilling task is borne by this rig.

Right:
TWO ELECTRIC SHOVELS are used in the quarries; here, one of them is loading a rear-dump unit with 25 tons of broken stone.

FROM PRIMARY JAW CRUSHER hopper (right) all product travels by belt-conveyor up to the 100-ton-capacity surge bin in the tower at the left.



third for swing service. It is anticipated that the swing mill will be used on the finish side much of the time while Type II low-alkali cement is being produced to fulfill the Glen Canyon Dam contract. Each mill is Symetro-gear driven by a 1,250-hp. motor.

Raw feed material arriving by the belt-conveyor from the layered-storage area is spouted into a 200-ton-capacity bin. A Merrick Feedoweight proportions the mill-feed product which is then carried to the mill by a covered belt-conveyor. The single-compartment mill is semi-air-swept and is closed-circuited with two 14-ft. Raymond single-whizzer air separators. The raw mill both grinds and dries, and hot air is supplied by a Todd gas-fired furnace. After attaining proper particle size, the product is carried to the blending and homogenizing silos by a 10-in. Fuller-Kinyon system.

There are two 28-ft. diameter by 98-ft. high blending silos ahead of a 40-ft. diameter by 78-ft. high homogenizing silo. Transfer from the two blending silos to the final homogenization silo is by Fuller rotary feeders to an Airslide, then to a Fuller-Kinyon pump system. Homogenization is accomplished by air introduced through ceramic aerating plates in the bottom of the silo, and the product is carried pneumatically to a 60-ton kiln-feed bin.

The level of material in the kiln-feed tank is regulated by a Jeffrey Waytrol, which in turn controls the r.p.m. of a screw feeder beneath the tank and the Waytrol. Kiln feed is pre-heated in an F. L. Smidth Cyclone two-stage preheater. The Waytrol belt and the feed screw are both tied in with the kiln speed to synchronize the feed rate. A Ward-Leonard d.c. system drives the kiln, feed belt, and screws at adjustable speeds.

The two rotary kilns are F. L.

SCREENS AND IMPACT CRUSHER located within the steel-frame tower are supplied via the inclined conveyor at the right. Minus 3/8-in. product then goes on to the sampler building before being piled in the storage-blending area.

CLINKER SIDE of the huge storage area; note the reclaimer at the left.

Smidth 10- by 12- by 350-ft. all-welded units. Each rides on four tires, and each is gas-fired, with all controls, recording instruments, and regulatory devices grouped on a control board on the burning floor. The board, built by the Swanson Engineering Company, Inglewood, Calif., incorporates the Swanson Panelgraphic display and Graphalarm indicators. Bailey, Taylor, and Leeds & Northrup instruments register and record the variables in the system and automatically regulate the operation of the clinker cooler, fuel rate, and damper positions.

Gas flow from the kilns is through the preheaters, the Buell cyclones for primary dust removal, and then a 100,000 c.f.m. 500-hp. Buffalo Forge induced-draft fan. Each fan discharges the gases at about 550 deg. F. to its baghouse for final cleaning. The woven-glass fabric bags are heat-resistant to 600 deg. F. Each baghouse contains 576 bags, each 11½ in. in diameter and 25 ft. long, with a total filtering area of about 42,500 sq. ft. An automatic timer controls the periodic collapsing of the bags for cleaning in each baghouse

A 7- by 41-ft. Fuller horizontal-grate cooler, equipped with a breaker at the discharge end, reduces clinker temperature and recuperates secondary combustion air. A dragchain conveys the clinker from the coolers and transfers it to a belt-conveyor system which delivers through a sampler station to the storage area. The clinker is layered in the storage piles by the traveling stacker in a manner similar to that used in the raw-material piles and recovered cross-sectionally by the bucket-wheel reclaimer.

Clinker from the reclaimer is conveyed by a belt system and passes over a scalping screen with oversize clinker reduced by a double-roll crusher. Sized clinker is then conveyed to a mill-feed bin by a 24-in. by 380-ft. belt-conveyor. Gypsum is also carried on this belt. It is fed to it from an adjacent storage hopper in the clinker-reduction area.

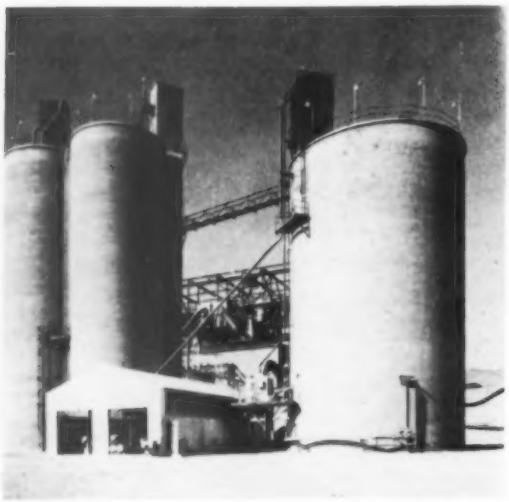
The feed bin at the mill is compartmented to contain both the clinker and gypsum. Combined capacity of the two sections of the bin is about 200 tons. Separate Feedoweights proportion these ingredients, discharging them onto a short belt-conveyor which feeds the mill. Closed-circuit grinding is effected with a pair of 14-ft. Raymond double-whizzer air-separators, which have provision for air-cooling. Grinding mill controls and regulatory devices are grouped on panels, one for each mill.

Finished cement passes through an F. L. Smidth cement cooler and is then pumped through a 960-ft. 8-in. pipeline to the storage silos. The ten silos, along with their four interstice bins, have a total capacity of 180,000 bbl. A single 4-spout St. Regis packer handles the sacking operation. Bulk truck shipments are loaded from the two external sides of the silo house through a Fuller Airslide draw-off system.

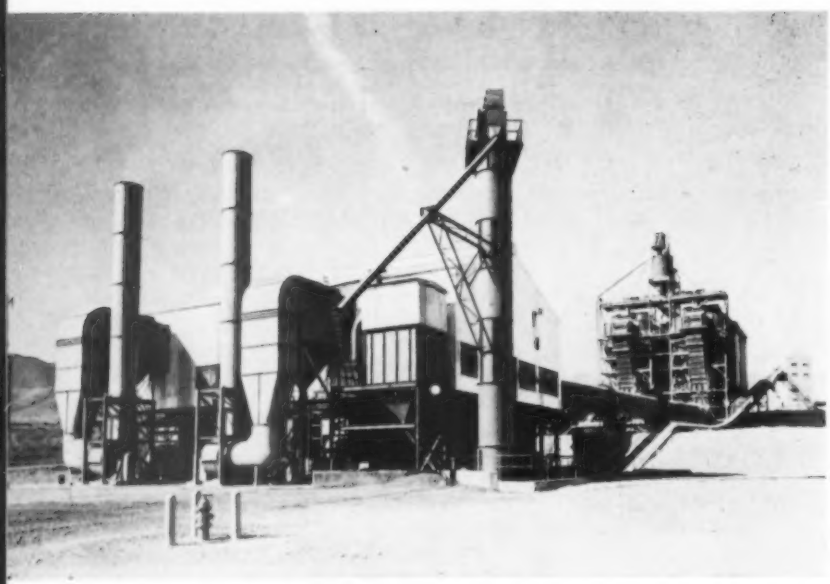
Motors and other electrical equipment used in the plant are by General Electric.

The water supply for the facility comes from two wells 810 ft. deep which provide a total flow of 950 g.p.m. Storage is provided in a 250,000-gal. elevated tank.

A modern office-laboratory building and a 100- by 150-ft. warehouse

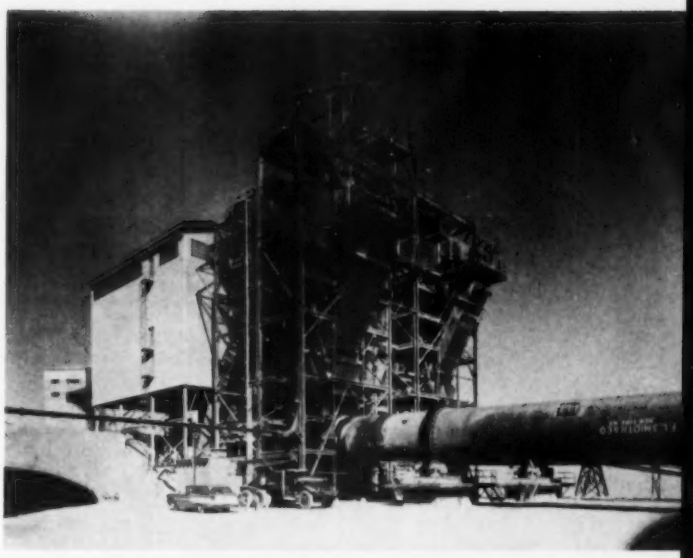


THE TWO BLENDING TANKS and, at the right, the homogenizing silo where the dry raw-mix is prepared for burning. The structure in the center houses air compressors and pneumatic pumps.



KILN ROOM—rear-end view—showing the exhaust fans and stacks, with the 75-ft. emergency bucket elevator (right) for by-passing any reject clinker. Alongside the kilns is the belt conveyor which carries clinker about 900 ft. to the sampler building (right, background) and then on to the storage piles.

BAGHOUSE (behind the kiln-feed structure) contains 576 glass-fiber bags where the kiln-exhaust gases are filtered. The bags have a total filtering area of about 42,500 sq. ft., and are controlled by an automatic timer for periodic collapsing.

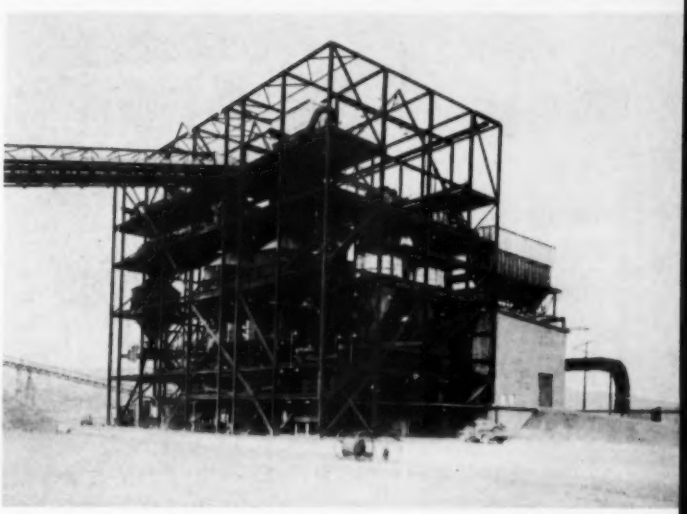


and maintenance building were built of concrete masonry on concrete slab foundations. Prestressed concrete beams form the structural members of the roofs.

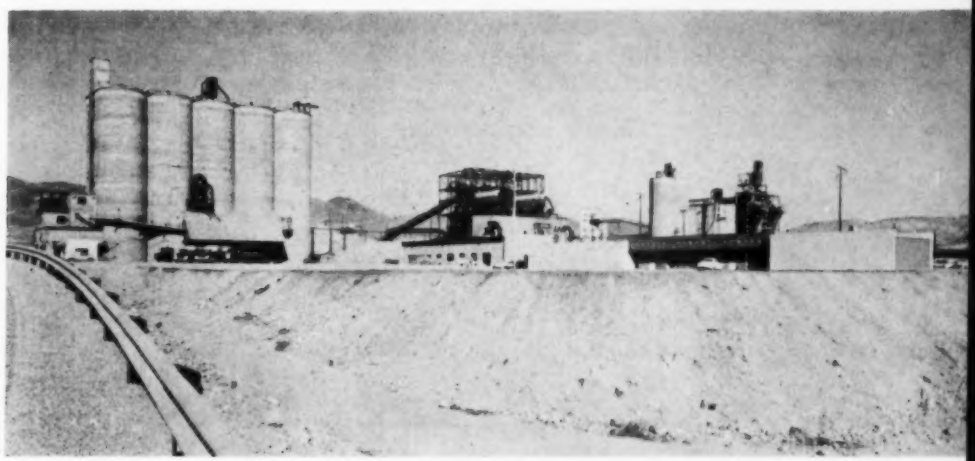
General offices of the Phoenix Cement Co. are at 3424 N. Central Ave., in Phoenix. Ray R. Adams, president, served as project manager for the Clarkdale plant. He has spent 32 years in the cement industry and before coming to Arizona was superintendent of the Peerless plant at Port Huron, Mich.

Frank N. Steadman, vice-president, also came from the Peerless organization, where he was sales manager for more than ten years. W. A. Warriner, assistant to the vice-president, served as Arizona sales manager for the Riverside Cement Co. for 35 years.

Charles W. Fox, operations manager, was in charge of design and construction of the Clarkdale plant and was formerly with Hercules. Jack G. Van Meter, plant superintendent, was formerly with Riverside and assisted in the design and construction of the plant. R. F. Lowe, chief chemist, came from the technical staff of the Peerless company. L. R. Gregory, plant engineer, and H. R. Johnson, quarry superintendent, are other transferees from Riverside in California.



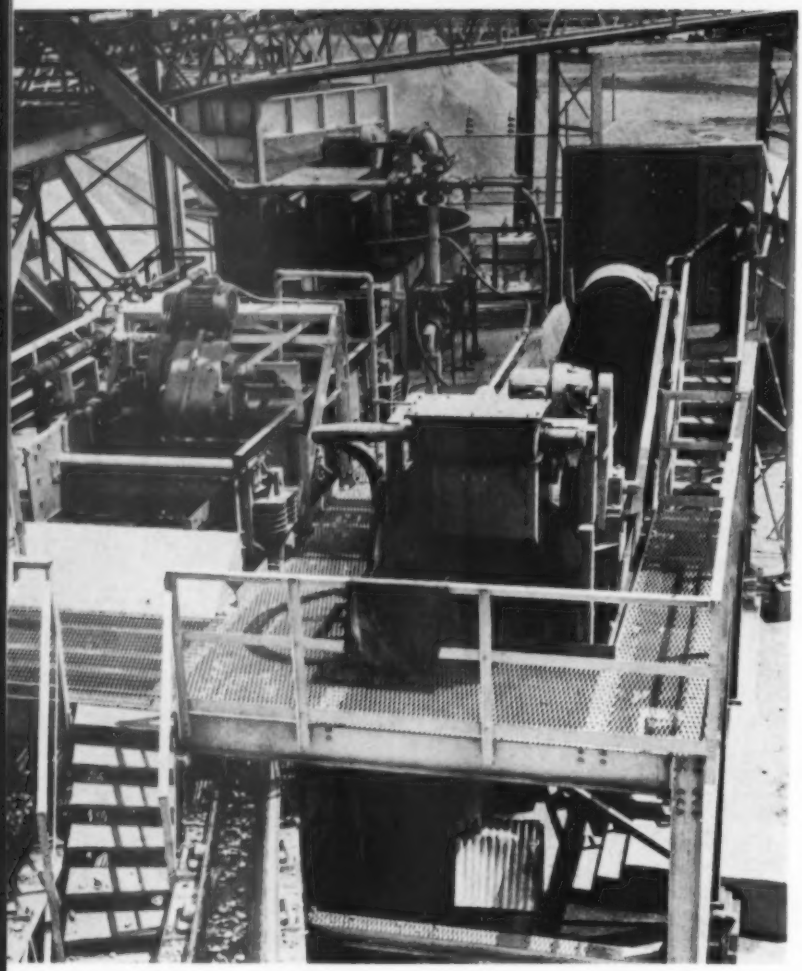
THE MILL BUILDING houses the raw, finish, and swing ball mills, each 19 by 12 ft. in size. Other equipment includes the cyclones, air-separators, dust collectors, and two cement coolers.



GENERAL VIEW of the Clarkdale plant. The low, flat structure at the right houses the offices and laboratory.

HEAVY-

By HARRY F. UTLEY



Left:
CLOSEUP OF THE H.M.S. DEPARTMENT—the rinse screen is at the left and the spiral densifier at the right. The sink and float product (in that order) is coming up on the conveyors (lower left).

Below:
THIS VIEW OF THE SCREENING STRUCTURE shows the complex of conveyors serving it. In the center is the H.M.S. department.

MEDIA SEPARATION—

One Feature of Southern Pacific Milling's New Plant at El Rio, Calif.

ANOTHER ON THE SPOT report

AGGREGATE specifications have little regard for deposits as laid down by Nature. Some deposits are so clean, so well graded, so devoid of objectionable intrusions that they scarcely require washing and need only simple sizing to meet the strictest requirements. At the other extreme, painstaking scrubbing and complicated beneficiation is needed to yield an end product acceptable in present-day specifications for concrete.

Pit-run material for the new 400-t.p.h. El Rio, Calif., plant of Southern Pacific Milling Co. comes from the bed of the Santa Clara River. In occurrence, it contains primarily acidic and basic igneous particles, along with fragments of shale, siltstone and sedimentary sandstones. The offending portions are of relatively low specific gravity, and in addition to being soft and unsound, they are reactive to a degree.

H.M.S. Installation

S. P. Milling, and its predecessor, Montalvo Rock Company, had worked the river deposit for years a mile or so downstream from the new El Rio plant. When the new facility was conceived, it was decided at the outset to incorporate a heavy-media-separation section in the flowsheet to permit production of highest-grade aggregates from a rather low-grade deposit. Nearly four years of experience with sink-float at its Sisquoc, Calif., plant[1]—the first sand-and-gravel plant on the West Coast to utilize H.M.S.—provided the knowledge and the know-how.

The heavy-media department adjoins the main screening tower in the new plant; it is a 150-t.p.h. package unit known as a Mobil-Mill, supplied by Western Machinery Co. A 4- by 14-ft. Hewitt-Robins prep screen cleans up the oncoming gravel (previously conventionally processed) from the stockpiles and rejects to a 10-ft. Wemco cone separator. This is one of the largest separatory vessels of its type employed in this industry, providing a very large pool section to improve the sink-float separation.

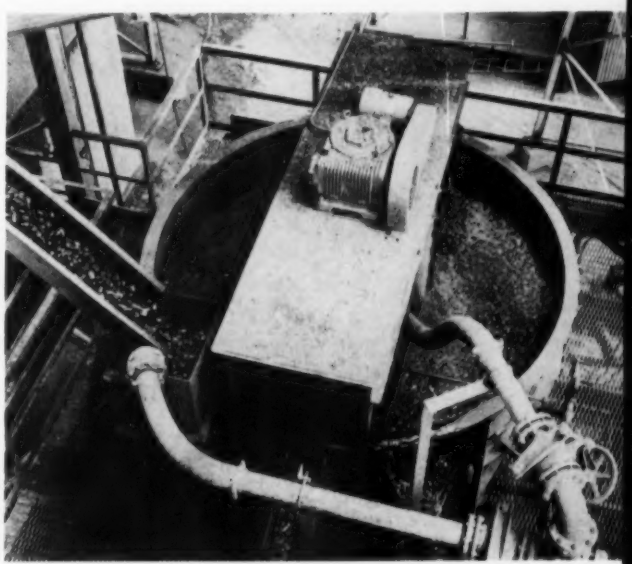
The media consist of a suspension in water of about equal parts of magnetite and ferro-silicon in sufficient volume to create a liquid of 2.55 specific gravity. Dense, hard gravel sinks, and the lighter fragments float to effect the separation.

Both the sinks and floats are then drained and washed of adhering media over a longitudinally-divided screen, and the good gravel (consisting of sinks) is carried by conveyor to a truck-loading bin. Float material is carried to another bin for disposal. Drained media return for re-use in the cone, while the dilute portion is pumped to a magnetic separator, densified in a Wemco spiral dewaterer, and finally returned to the media sump after de-magnetization.

Other Major Features

While the H.M.S. department is of particular interest, the new plant in itself is a modern, flexible, highly-automatic operation. Adequate headroom is apparent everywhere in the structures to simplify maintenance and possible future changes, the addition of chutes, etc. Preliminary design was worked out with Western-Knapp Engineering Company, San Francisco; and the Arthur E. Howland Company, Los Angeles, was later engaged to do the final engineering and detail the construction drawings.

Excavation in the river deposit is



THE 10-FT. SEPARATORY CONE, shown with the feed chute (left), which is riffled to resist wear.

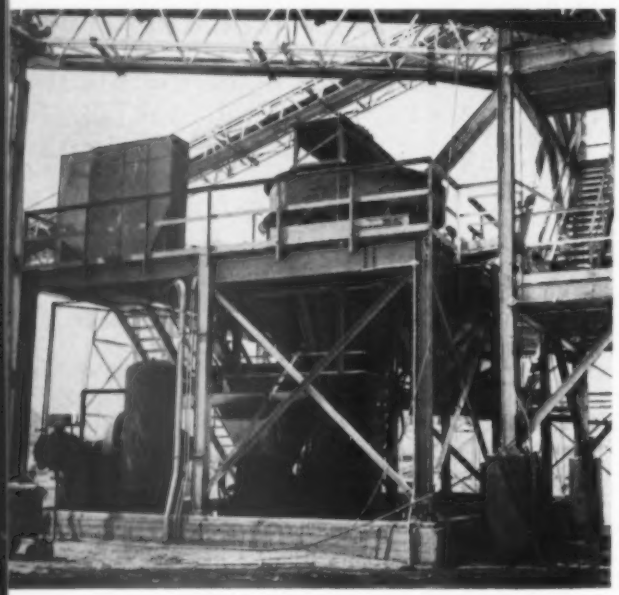
[1] PIT AND QUARRY, September, 1956, pages 88-91.

done by a Northwest 95 diesel dragline pulling a 3½-cu. yd. bucket. The machine loads Euclid bottom-dump trucks which carry 38-ton loads a mile or less to the 70-ton drive-over receiving hopper.

Crushing and Screening

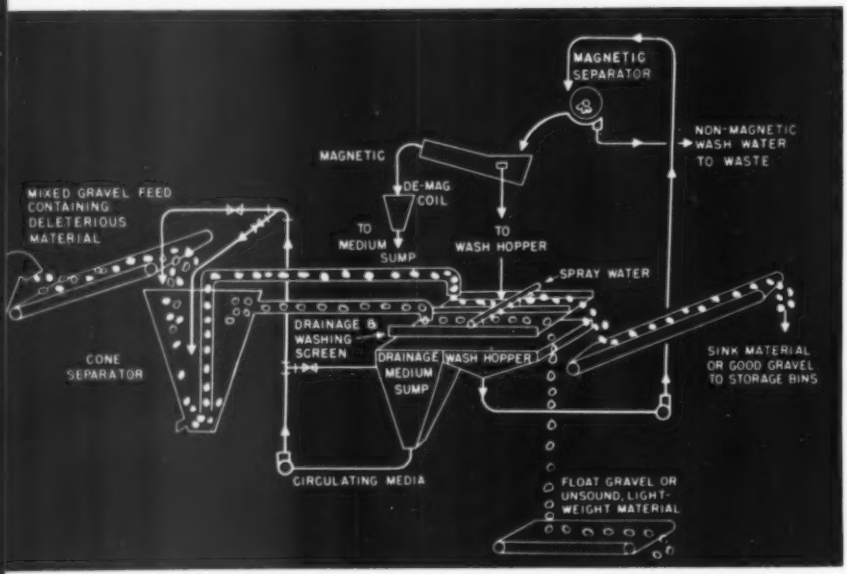
A grizzly made of 10-in. I-beams spaced 18 in. on centers rejects an occasional boulder before the pit-run is fed by a Syntron grizzly-pan feeder to the primary breaker, a 36- by 24-in. KueKen jaw crusher. Feeder throughs and crusher product (minus 3-in.) are carried by conveyor to build up a primary surge pile. Enroute to the pile, the material is transferred *via* a 4- by 12-ft. Hewitt-Robins single-deck scalper screen; oversize is carried on a short horizontal mud-picking belt to join the screen throughs for transport to the pile.

The surge pile has a live storage capacity of 4,000 tons, enough to supply the plant for a full day's run. Input to the pile is calculated at 600 t.p.h. and output at 400 t.p.h. Output is by way of a No. 66 Syntron feeder in the tunnel to a 30-in. reclaim conveyor which travels out and up to the top of the main screening structure.



ANOTHER VIEW OF THE H.M.S. DEPARTMENT, showing the 10-ft. cone, the compressor, and media - recovery equipment. The compressor supplies the air-lift which elevates the sinks to the upper discharge level.

FLOWSHEET of the package unit heavy-media department, a 150-t.p.h. setup.



The deposit has an excess of fines, those passing No. 4 mesh running as high as 60 to 70 percent. Wasting surplus fines can be a costly operation, and the company management delved into this matter very thoroughly. If a dry-screening operation were set up to waste the fines, too high a percentage of coarse material would probably be wasted along with the fines; this fact eliminated the idea of dry-screening in the pit.

The final flow was established to do the preliminary fine screening on the lower deck of a 5- by 20-ft. Hewitt-Robins Hi-G 2-deck screen. This big screen is the first unit to handle the pit-run coming up from the surge pile, plus 1-in. being rejected on the Hi-G's upper deck. The material is chuted to either of two Symons cone crushers at ground level. Flow is normally to a 3-ft. standard cone; the other unit is a 4-ft. short-head.

These crushers are mounted side by side, a common belt conveyor carrying the products to a transfer tower for dry sizing. Gravel retained on the 5/16-in. slotted mesh on the lower deck of the Hi-G is normally conveyed to a pair of 4- by 12-ft. Hewitt-Robins double-deck wet screens for washing and sizing to finished product.

Sizing, Stockpiling

Hi-G screen sand throughs are split three ways, going to (1) a storage pile supplying a hot-mix asphalt plant, (2) to the washing-sizing screens, or (3) to waste. Depending upon fineness, sands passing the wet sizing screens are diverted to the concrete- and plaster-sand circuits, or they may be wasted. Two Wemco sand-preparation machines process sand, a 48-in. spiral dewatering the concrete sand and a 30-in. spiral handling the plaster aggregate. The latter is stockpiled separately; concrete sand is carried by a stacking belt to the extreme end of the over-the-tunnel storage piles, where a shuttle belt builds up an elongated

pile of 5,000 tons live storage capacity.

In the wet-screening circuit, all possible gravel is saved; varying amounts of minus No. 8 sand are wasted. The circuit operates so efficiently that only a very small amount of 3/16-in. to No. 8 material is lost in the process.

Disposal of waste fines posed a problem, taking into consideration the prohibitive cost of trucking the excess away, or the limitations of a plain gravity system of sluicing away the dirty water and sand. Finally, it was decided to install a hydraulic disposal system to pump the waste slurries back into a worked-out section of the river-bed pit. This method has worked out very well, the management reports, and has resulted in keeping production costs down.

Another screen in the main screening tower, a 4- by 14-ft. Symons horizontal double-deck unit, operates dry in making crushed product in closed circuit with the short-head cone, primarily to supply hot-plant needs. Output is carried by another belt-conveyor to the No. 2 screening tower, where the hot-plant aggregates are sized. Sizing equipment includes a 42-in. by 10-ft. Symons screen and a 4- by 12-ft. Hewitt-Robins screen, both double-deckers. Five hot-plant sizes, three coarse and two fine, are stored over a reclaim tunnel which supplies the 6,000-lb. Madsen asphalt plant bins.

Flumes and chutes throughout the plant are amply provided with flop-gates and diverters to assure a high degree of processing flexibility, permitting almost any type of product to be made, or to increase or decrease the volume of any desired size or gradation. Audible and visual signals warn of trouble, and interlocking of the various drives prevents pile-ups. All the chutes are riffled, so that material moves over material to resist wear. Transfer and screen-head boxes are similarly protected.

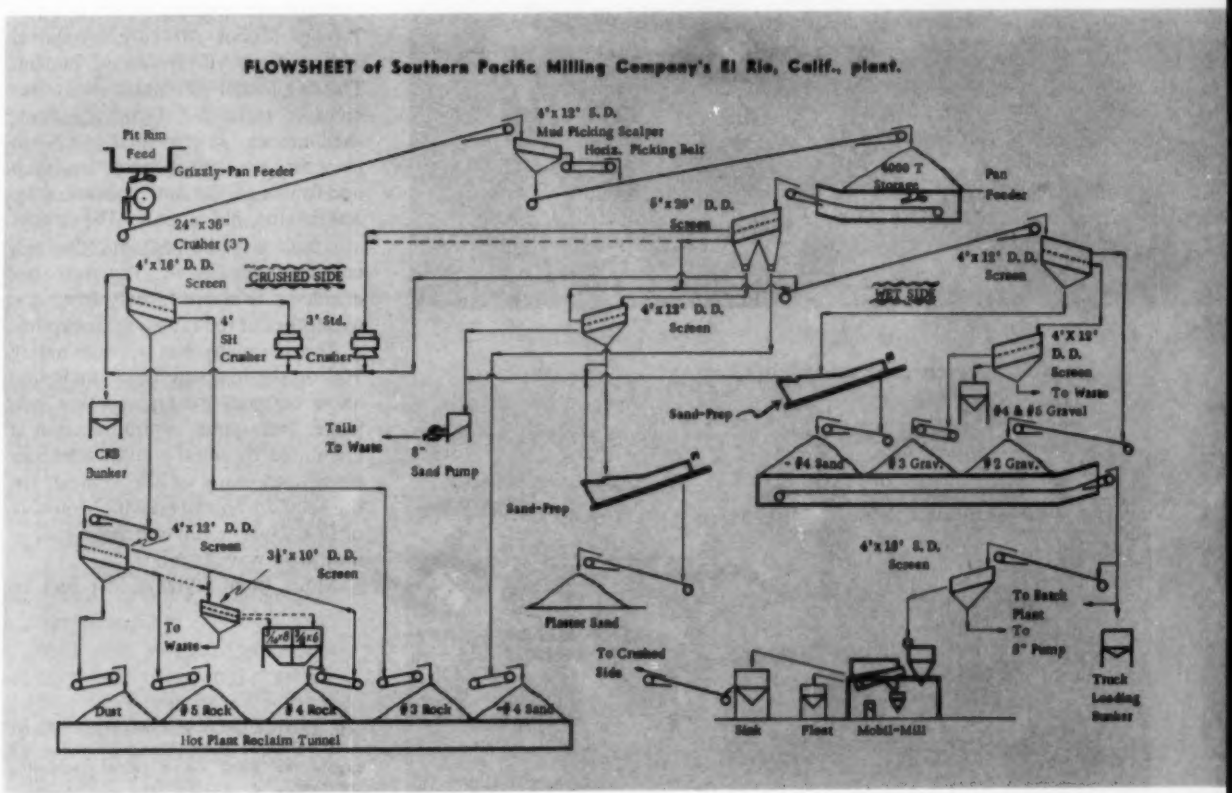
Two grades of coarse aggregates are normally stockpiled—minus 1½- to ¾-in.; and 1-in. to 4- in. mesh—designated locally as No. 2 and No. 3 gravels. Separate 18-in. belts stack the two products in 2,000-ton live storage piles over the reclaim tunnel, ahead of the larger pile of concrete sand. Pea gravel is handled separately *via* a truck-loading bin.

Twin Noble ready-mix batch plants are located on the property. The bins of these plants are filled by a belt-conveyor that is fed either from a below-ground truck hopper, or by transfer from the main reclaim conveyor carrying to the load-out bins. Bin storage at the batch plants totals 400 tons, and three silos have a combined capacity of 1,500 bbl. of Type II low-alkali cement.

The heavy-media-separation department is conveyor-fed from the main storage pile reclaim tunnel. Incidentally, there are two parallel reclaim belts in this tunnel, one for loading out the plant-processed aggregates and the other to supply the H.M.S. department.

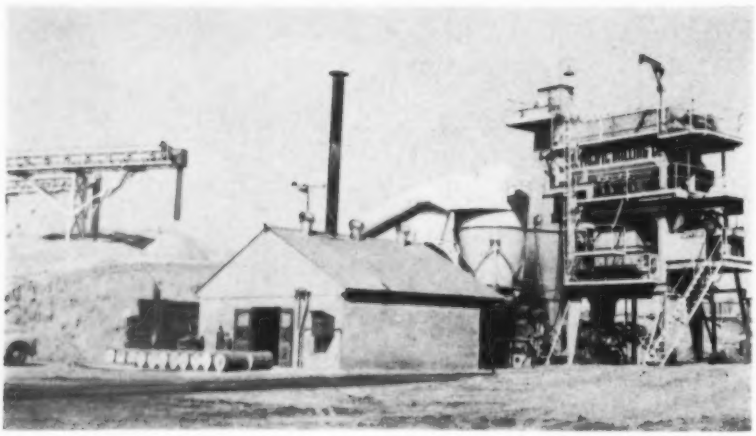
Controls

The load-out bin is a 5-compartment, 450-ton steel structure which straddles a 70-ft. scale platform alongside the scalehouse. Bin gates



Left:
NOTE QUIESCENT POOL in this 48-in. diameter spiral which prepares and dewaters the concrete sand before it is conveyed to stockpile.

Below:
TWO STOCKPILES of washed and sized gravel. The reclaiming conveyor emerging from the tunnel at the left (see arrow) can transfer to the belt running up to the twin batch plants or deliver to the truck-loading bin at the scalehouse.



THE 6,000-LB. HOT-MIX ASPHALT PLANT AND BOILERHOUSE. Stockpiles at the left supply the plant via a tunnel reclaiming conveyor.

are air-operated and electrically controlled from a console within the scalehouse. A system of stop-and-go lights signals the truck drivers when to move or spot their vehicles, and there is little delay since the units are filled and weighed right on the 70-ft. platform. High- and low-level Bin-Dicators regulate the filling of the bins by automatically stopping the conveyor which brings the on-coming aggregates from the tunnel.

Master control in the scalehouse is, in fact, the nerve center of plant operations, and besides the console switches, foot-control switches are located on the floor beneath the operator's desk. Subcontrol panels on the batch-plant platform and duplicate controls for the tunnel man complete the control setup.

Loading, Trucking

In addition to the 70-ft. scale platform where trucks are loaded and weighed simultaneously, there is a 60-ft. scale platform on the opposite side of the scalehouse for weighing out other trucks carrying plaster sand, etc., which are loaded directly at the piles.

This operation (truck-loading at the piles) has been greatly accelerated by the installation of a Yale-Trojan Model 404 tractor-shovel with a 4-cu. yd. front-end bucket. This big loader permitted the retirement of three old 1-cu. yd. clamshell cranes. It can load a 25-ton truck in about 90 seconds, less than one-fourth of the time consumed by one of the old cranes. The trucks also have less idle time, and the high traveling speed of the Trojan loader enables it to move rapidly from one to another of the far-flung stockpiles.

The company has approximately 100 on-the-highway units, including about 60 truck-mixers, mostly Challenge. Intra-plant communication is facilitated by multi-station intercom units, and many of the vehicles on the road are equipped with Motorola or G-E 2-way radio utilizing a special industrial wave band.

More than 7,900 lineal feet of

THE CONSOLE ELECTRIC-CONTROL BOARD in the scale-house.

THIS TRACTOR SHOVEL, equipped with a 4-cu. yd. bucket, can load a 25-ton-capacity truck in about 1½ minutes.

Thermoid belting was used in the conveyor system. Water comes from two wells. A 150-hp. Wintroath pump supplies a maximum of 1,800 g.p.m. for washing purposes at 90 p.s.i. at the spray nozzles. A 25-hp. Wintroath pump at the second well has a capacity of about 800 g.p.m. and stores water in a 20,000-gal. elevated tank to supply the batch and hot-mix plants, truck wash-out facilities, and domestic needs.

Organization

Southern Pacific Milling's growth has paralleled that of coastal California, and since 1885, the S.P. circle has been a familiar trademark in that region. The company is no longer in the grain-milling business, but its 12 locations serve Ventura, Santa Barbara, and San Luis Obispo Counties with sand, gravel, ready-mixed concrete, asphalt-plant mix, and related building products. All told, it owns 11 batch plants, 4 aggregate-production plants, and 4 asphalt-mixing plants. It also engages in the paving and grading business with its El Rio Construction Division. At Vandenberg Air Force Base, and the Navy's missile-launching program at Point Arguello, special jobsite plants are meeting the demands of the Pacific Missile Range.

A modern headquarters office building has been erected at the El Rio plant. Philip E. Holmes, vice-president and general manager, heads the organization. Milton F. Masters is Southern Division manager. Les Root is production manager and Russ Kinyon is plant superintendent at El Rio. Robert Littlejohn is Northern Division manager, with headquarters at Santa Maria.

An open house for persons close to the construction industries was held at the new plant on October 31, 1959. About 650 visitors were registered. After a tour of the main office facilities, which include new IBM machines in the accounting department, the visitors were taken on a mobile tour of the plant for orientation. A buffet lunch and refreshment center was set up in the new maintenance building. The area also had displays of interest set up by various suppliers and equipment firms.

Favorable 1960 Outlook Seen For Gypsum Industry in U.S.

Another good year is expected in the gypsum industry in 1960. This opinion is based upon several market analyses, which indicate an increase in commercial, industrial, and institutional construction, as well as accelerated activity in the field of home improvements.

According to an industry spokesman, shipments of gypsum products in 1960 could equal the 1959 total; and, depending upon design trends, there could be an increase.

Long-range planning is proceeding on the basis of a continuing high level of activity in both the residential and nonresidential areas in the early '60s; and still greater activity is anticipated by the mid '60s.

Cement Plant Roof Cleaning Facilitated by Air-Water Mix

During the late summer months of 1959, employees at the Metaline Falls, Wash., plant of Lehigh Portland Cement Company were faced with considerable roof cleaning. According to the Lehigh *News Conveyor*, instead of the old pick and shovel method, the maintenance men tried a mixture of air and water and found that this method made the job faster, safter, much cleaner, and less damaging to the roofing.

A Y-shaped mixer was made up of ¾-in. pipe and control valves for both air and water. Pipe nozzles ranging from 4 to 8 ft. long were attached to the mixer. Air pressure from 80 to 100 p.s.i. furnished adequate force, and sufficient water was added to do the necessary cutting. The volume of water was not enough to make the job messy, but it eliminated almost all dust.

PREVENTIVE maintenance for crushers

PART 1

Even under the best conditions, working parts of processing equipment are subjected to continuous wear. This wear, however, is predictable—and repair work should be both planned and scheduled.

By A. K. **BOSZHARDT** and M. P. **HAHN**
Processing Machinery Dept.
Allis-Chalmers Mfg. Co.

THROUGH planned maintenance the most convenient and least expensive time is chosen to do necessary maintenance work.

The full productive ability of machines can be assured through periodic inspection which will allow making necessary repairs before serious failure can shut the plant down.

At one large plant the amount of breakdown maintenance was fantastic. Maintenance men were the highest paid employees in the plant, including all their overtime; but even with this high pay, they never knew when they would be called out to the plant, and the master mechanic worked night and day, seven days a week, trying to get ahead of breakdowns. Eventually he quit because "life was too short" to work under conditions like that.

The answer was to shut down the plant for a sufficient period to make permanent repairs in an orderly manner on the important machines. Once this was accomplished, minor repairs could be made during operation and a planned maintenance program was put into effect. This plant is now operating with very little emergency overtime and much less maintenance expense, and it is in continuous production.

Design and Installation Helps

The principal reason why machines need repairing can be tracked down and thus classified—inadequate installation, wear, overload, inadequate lubrication, corrosion and stress, concentration, improper line-up, and vibration.

In order to avoid **inadequate installation,** pay strict attention to manufacturer's recommendations. If the information you have on drawings or in bulletins is not adequate, insist on more information. A poor installation can wreck the performance of any good machine.

Attention should be given the feed arrangement. Is it large enough for requirements? Will it distribute the material evenly, as required? Will the discharge conveyors handle the product so that the danger of material backing up and plugging the machine will be avoided?

If possible, have electrical controls interlocked so that the discharge conveyor cannot be stopped unless the feed belt is stopped. If necessary, the machine itself can be stopped if sufficient time delay is allowed to clear the chamber.

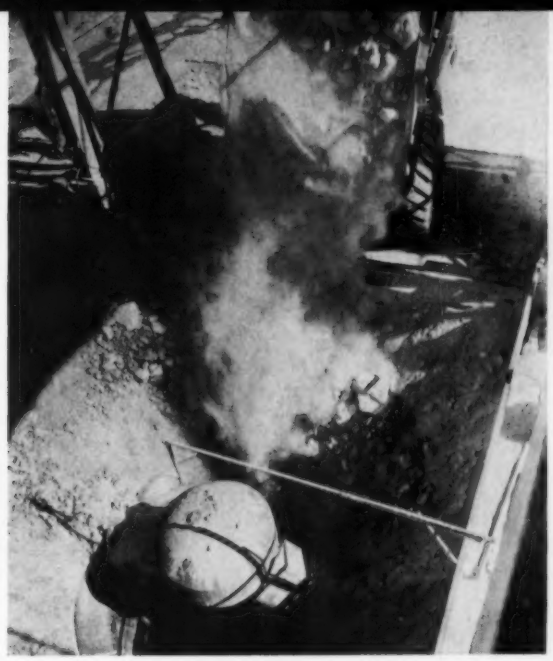
Metal detectors should be incorporated if tramp iron is a hazard. Chutes and most conveying devices should be easily removable to facilitate making repairs.

Considerable maintenance time can be saved by providing adequate supporting beams for hoists to handle heavy parts conveniently—and safely. All parts that must be inspected and lubricated periodically should be easily accessible, so that they will not be neglected.

Maintenance becomes excessive when **wear** is caused by dust and dirt that enters into moving machine elements. Worn dust seals or material plugging up a machine will permit fines to be forced through normal clearances between operating parts. Another cause of wear is the use of lubricants in which abrasive dust has accumulated.

Most machines can take a small **overload** continuously and larger ones intermittently; but overloads such as those caused by a dipper tooth going through a crusher will strain or damage bearings and gears; stresses will be increased in the machine frames, shafts, and other parts. Continued overloads, if not instrumental in rapid failure of a part, will

and screens



Crushers take a beating through wear and tear even under the best conditions. This wear can be predicted and should be used as a basis for regularly scheduled preventive maintenance.

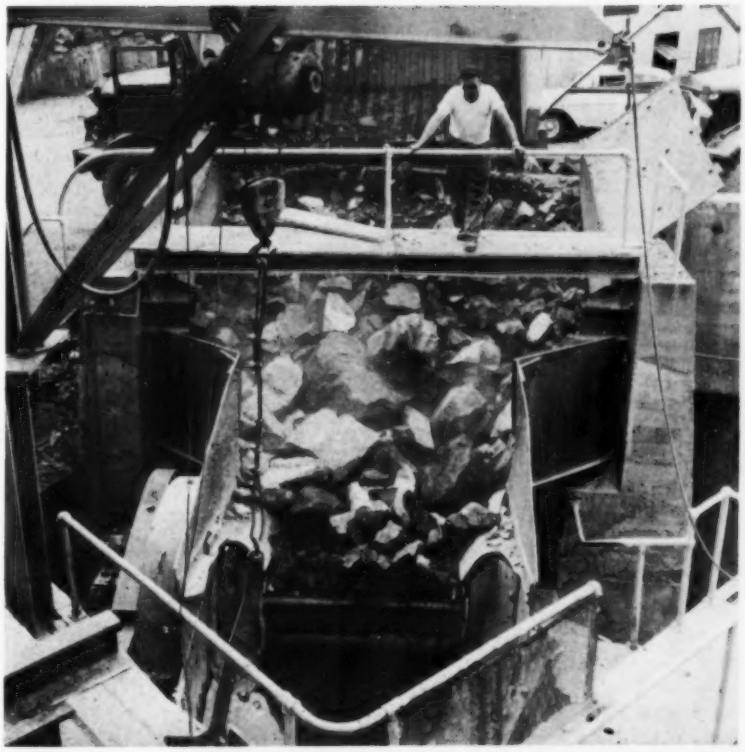
certainly seriously reduce the useful life of a machine.

Manufacturers' instructions regarding **lubricants** and lubricating periods should be followed carefully. Much time is spent by manufacturers in co-operating with leading oil companies to work up the lubricant specifications. It is dangerous to experiment. Specification of the correct lubricant is today a very complex problem.

Many types of oils and greases are available, and many factors must be considered, such as lubricant viscosity, operating temperature, oxidation stability, filtering qualities, effect of climate extremes when machines are in unheated buildings or out of doors, film strength necessary to carry the load (particularly on gearing), and corrosive effect of the lubricant on the various kinds of materials used in the machine.

Corrosion effect on strength of machine elements is not generally appreciated. Most failures in machine elements occur as fatigue failures, very much like a brittle material fracture. A crack starts at some spot (generally on the surface) due to a corrosion pit, a notch, an oil hole, or a key way. Under the repeated load of alternate tension and compression, this crack progresses through the part.

Corrosion can reduce the fatigue strength of a part as much as 70 percent. Plain tap water running over a rotating shaft can reduce the strength of the shaft (compared to its dry, uncorroded polished condition) as much as 50 percent. Salt water or



Feed arrangements and similar equipment related to the main processing machinery should be adequately sized and arranged to distribute crusher feed evenly. Electrical interlocks between feeder, crusher, and discharge conveyor help to prevent equipment damage and unscheduled stops for maintenance. (This photo shows a side-dump feed arrangement.)

other more corrosive water can have more serious effects. For this reason it is important to keep highly stressed machine parts such as coil springs, etc., free from corrosion to prevent rapid failure.

On the Mesabi Iron Range, heavy steel coil springs supporting a large vibrating screen were failing every two to three weeks. Metallurgical examination showed corrosion fatigue failure. Inspection of the installation showed that highly corrosive wash water was running over the springs. This situation was corrected, and the new springs installed have been used for several years.

Improper lineup—Machines that have drives with separate bearings resting on concrete or steel foundations (ball mill and rotary kiln drives) are highly susceptible to misalignment. Present design practice is to incorporate flexible couplings in the drive to minimize this effect, but even this provision does not remove the necessity for accurate lineup and constant watchfulness in this respect during operation. Along with this checking, gears and pinions should be accurately meshed with proper operating clearance. *It is better to have a little too much backlash than not enough.*

Vibration is the enemy of long machinery life. It can be caused by rotating parts out of balance, worn gearing, poor lineup, or inherent design characteristics of the machinery or its supporting structure. Some machines, by their duty, are inherently sources of vibration, such as gyratory and jaw crushers and vibrating screens and conveyors. Unless massive foundations are possible, the only recourse is to isolate these machines from the structure by the use of coil springs, rubber vibration mountings or suspension cables without springs, depending upon the plane of movement of the machine.

As rotary kilns became longer and were being operated at higher speeds, vibration became a serious problem. This kind of service has called for more accurate gearing. It was necessary to make a very complex analysis of the kiln and drive to eliminate operation within the critical speeds. This is the task of the designer and builder; nevertheless, this precision equipment must be carefully inspected periodically to insure proper operation and long life.

Gyratory Crusher Maintenance Following general plant considerations, specific maintenance items should be studied. A planned program of preventive maintenance is recommended for trouble-free operation of a crushing plant. Operating conditions vary so widely that it is impossible to recommend one schedule of preventive maintenance for all crushers.

Yet, some sort of regular inspection should be followed. It is suggested that records be kept of the periodic inspections and maintenance of the crusher. This recognition of maintenance procedure will keep the unit in good working condition and will prevent costly breakdowns.

One of the best rules to follow in the proper maintenance of a crusher is to keep a record of the actual operating hours. Then, after a predetermined period of operation has elapsed, the crusher should be given a thorough major inspection. The length of this operating period will vary with the type of product and the number of hours of operation, and can best be determined from experience.

New equipment, however, should be examined after a relatively short period of operation. The next major inspection period can be lengthened somewhat. This system may be followed until the maximum period of operation is reached. This interval should be considered and adhered to as the operating schedule between inspections.

In addition to the crusher, the maintenance program extends ahead of the primary crusher and follows through at each crushing station covering both feed and discharge conditions. (For example, the shovel operator should check daily to make sure that the dipper teeth are not loose. This routine will prevent a stray tooth from getting into a load of quarry-run material and jamming in the primary crusher.)

Attention should also be given to the feeding arrangement. In order that feed to the primary may be distributed evenly throughout the chamber, it should be passed over a splitter. At the other end of the machine, the discharge should be adequate to take surge conditions, so that the conveyor taking the material on to the secondary crushing station can, in turn, work smoothly and not create surge conditions.

Secondary and tertiary crushing stations should have even feed distribution to the gyratories, so that the feed is even and the wear is constant throughout the chamber. Chutes and spouts should be ar-

A planned program should be the result of keeping records of periodic inspections and maintenance. This planning technique is particularly valuable in co-ordinating maintenance among items of related equipment (such as vibrating screens which feed crushers), so that down time may be minimized.

ranged to minimize segregation of fines. Scalping screens are practically mandatory ahead of these stations to prevent fines from entering the chamber and thus cause packing and resultant high power demands.

The casual observer will not notice any major changes in gyratory crusher design when comparing the older type machines with the modern units now offered by manufacturers of heavy crushing equipment.

Yet a number of important changes have occurred which result in higher crushing efficiency, better product, and less maintenance for crushing plant operators. In the following section some of these important new design developments are described and discussed.

Bearings 1. Modern spider bearings with an hourglass shape afford longer life than the older tapered sleeve type. The mainshaft journal in the spider bearing is fitted with a pressed sleeve, compared to the previous design without the sleeve. The surface of the hardened sleeve is more suitable for a bearing than the shaft material that is required for strength.

In addition, when galling takes place because rock works against the mainshaft, it is not necessary to dress down the mainshaft. Instead, the sleeve can be removed in the field and a new one put in place without disassembling the entire crusher.

2. Eccentric bearings are now made of steel, with an inner bronze sleeve. Previous designs called for babbitt. This change has resulted in increased bearing life, and it allows crushers to gyrate at a higher speed than previously. The bottom is protected with a replaceable bronze bushing.

3. Pinion-shaft bearings are now of anti-friction design. With the cartridge type pinion shaft assemblies now available, downtime required for replacement is reduced to a minimum.

Lubrication 1. For spider bearing use semi-fluid grease.

2. An eccentric bearing has an external system with dual lubrication to the upper and lower parts of the eccentric. The flow of oil returns to the external tank and cooling system for recirculation. For winter operation of an external system the normal recommendation is 300 universal saybolt second oil; for summer operation, 700 universal saybolt oil at 100 deg. F.

The external oiling system is designed on a unit replacement basis, so that the cooler, pump, motor, and filter are easily accessible for quick replacement in an emergency.

3. For pinion-shaft separate pool lubrication from an external eccentric bearing system, the same oil specification is recommended as for eccentric bearing.

Bevel Gear and Pinion New designs call for spiral bevel gear and pinion *versus* the previous spur type. Working life is extended considerably with this type of design, which also affords a smoother-running crusher.

Dust Seal Latest methods call for a simple and effective ring of suitable long-wearing material which protects the important bearing areas. Older designs allowed contamination of the oiling system with dust and dirt around the crusher.

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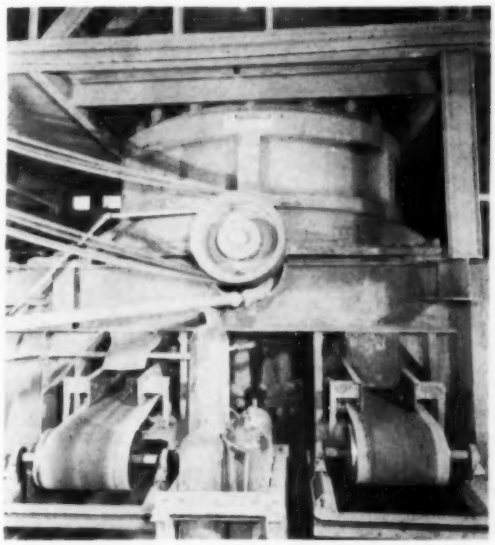
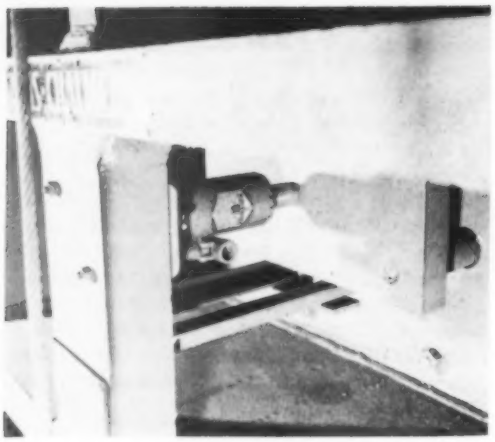


Discharge should be adequate to handle surge conditions, assuring smooth flow to subsequent processing areas. But even more important, this provision prevents unscheduled maintenance caused by machine damage.

One week out of the year should be adequate for thorough inspection and testing of any large jaw or gyratory crusher.



A hydraulic jack placed at the back of the jaw crusher frame permits easy adjustment of the pitman, toggle, and swing jaw assembly, and facilitates the removal of toggle plates.

CONSISTENTLY SYSTEMATIC INSPECTIONS of your crusher will result in less maintenance . . . less down time . . . fewer repair bills. Maintenance checks will help in determining wear, and failures will be detected before they cause serious damage. Crushers operating many hours each day will require more frequent checks. These three charts—Daily Maintenance Check, Weekly Maintenance Check, and Major Maintenance Check—are excellent guides.

DAILY MAINTENANCE CHECK

LUBRICATION SYSTEM	Check amount of oil in storage tank. Tank should be 3/4 full before starting and at least 1/4 when operating.
	Clean oil filter – when oil pump is not running – by turning handle to drain oil sludge from the cartridge through the petcock.
	Check oil pump and grease if necessary.
HYDRAULIC SYSTEM	Check oil storage (it should be full before starting to set the crushing head – and nearly half full if the head is near the operating position). Do not fill tank after setting the head as it will overflow if the head is lowered considerably.
	After starting crusher and starting feed, check supply lines and bottom plate cover gasket for leaks. Leaks will cause the crusher to lose its setting.
	Check close side setting with a chunk of lead. (See weekly check list for procedure for checking.) Do not set crusher closer than recommended. Set crusher when crushing chamber is empty.
SPIDER BEARING & PINIONSHAFT HOUSING	Check oil in the spider bearing. Oil level should be about one inch above spider bearing. If too much oil is being used check oil seal – use heavier oil.
	On 51 to 84-inch crushers check oil level on pinionshaft housing.
GENERAL	Check *Texrope* V-belts for wear, looseness, turning and breaks.
	With the crusher running, check for loose bolts and parts – tighten where necessary.
	With the crusher running, check oil screen for metal chips. A small amount of chips will occasionally appear on the screen; however, a sudden increase indicates excessive pressures on the bearing surfaces – and possible failure.
	Check for excessive noise when crusher is operating.
	Check return oil temperature every hour until it levels off.
	Check oil temperature when changing shifts and at shut-down.

Crushing Chamber Crushing chamber design has advanced considerably in recent years. Chambers are now designed to give optimum life to both the mantle and concaves and still enable an operator to obtain the desired setting of the crusher throughout the life of the chamber.

The crushing plant operator should watch the wear pattern on the mantle. When the life of the mantle is about up, cracking or buckling may occur, with resultant loosening of the mantle on the head center. A replacement mantle should be installed if any serious cracking occurs on the mantle.

If concaves are of extremely hard material, scarfing should be the regular procedure. This allows the manganese to expand and relieves the concaves, preventing extreme stresses from being built up in the crushing top shell. Usually the lower tiers of concaves require replacing after wear; the upper sections can be used several times before requiring replacement.

If a dipper tooth or some foreign material should pass through the crushing chamber, the operator should make a close inspection to see that damage has not been done to either mantle or concaves.

Hydraulic System Many modern gyratory crushers use the principle of the hydraulic jack to support the mainshaft instead of a thrust-bearing arrangement suspending the shaft from the top. This method has a number of advantages for crushing plant operators in that fast adjustment can be made to the setting when required.

In addition, in the primary crusher there are times when it can stall out with an overload; and in most cases primary crushers designed on the hydraulic jack principle can be started under load without costly down time for digging out the chamber.

In the case of cone crushers following the primary, an additional benefit is tramp iron protection.

Power and Automation Many plant operators today use an ammeter in running their crushers. This important instrument permits the operator to observe the amount of load on the crusher; he

can thus vary the feed setting of the machine according to the power demand. In this way an optimum amount of tonnage and product can be obtained merely by checking on the power requirements of the crusher under load.

In a number of plants that are going over to automation, a complete crushing system can be controlled by one operator. In these systems the setting and feed rate to the crusher can be varied according to the power requirements that each particular stage of crushing requires. This is particularly effective on secondary and tertiary crushing stages rather than the primary.

Jaw Crusher Lubrication Modernized In the manufacture of jaw crushers the use of anti-friction bearings has been standard on single-toggle jaw crushers for some time. However, in the case of the Blake or double-toggle type, the general rule has been to use sleeve-type bearings with elaborate external lubricating systems for the main and pitman bearings. Today the dougle-toggle jaw crusher can be furnished with anti-friction bearings; this is a major advantage in regard to maintenance.

Previously, leakage around a jaw crusher was extensive with an external lubricating system. This was true whether the system required grease or oil. With anti-friction bearings, pool lubrication can be used for the main and pitman bearings; and the entire crusher runs without the trouble caused by previous problems in regard to leakage.

Another improvement in the adjustment of jaw crushers is the use of a hydraulic jack placed at the back of the frame. The jack allows for easy adjustment of the pitman, toggle, and swing jaw assembly for changing settings. It also facilitates the removal of toggle plates.

On all types of crushing equipment it is good procedure to take time out once a year for a major overhaul of each particular crusher. It is estimated that approximately one week out of the year would be adequate for any large jaw crusher or gyratory crusher to be thoroughly inspected and checked. If it is found that there is heavy wear on any particular part, replacements can be made at that time, or a plan of action can be set up for the changeover later on. The importance of this major overhaul cannot be stressed too greatly, as by this type of procedure many operators can eliminate the emergency breakdown which is caused by failure of worn out parts.

In conclusion, it should be remembered that an adequate supply of the recommended spare parts, furnished by crushing equipment manufacturers, should be kept on hand at all times. Selection of the most critical items and those that are replaced more frequently will mean that an operator will have on hand most of the parts required for any emergency.

(Part II *will be published in the March issue.*)

WEEKLY MAINTENANCE CHECK

	Check all of the items on the Daily Maintenance Chart
LUBRICATION SYSTEM	Check for dirt and sludge. If dirty, check the filter and replace cartridge if necessary. Change oil when there is dirt suspended in it or when a large amount of sludge has formed in the bottom of the storage tank. Drain the tank, clean and refill with new oil when necessary.
	Check all oil lines and crusher joints for leaks.
	Lubricate the oil pump motor.
	Check oil pump for noise and indication of wear.
HYDRAULIC SYSTEM	Check crusher to see if it is holding setting by passing a chunk of lead, resume crushing operation and then pass another chunk of lead. The two chunks of lead should be approximately the same thickness if the crusher is maintaining its setting. If not, check the bottom plate cover and supply lines for leakage, and the V-packing on the bottom of the step support piston for wear or cracking.
PINION-SHAFT	Check oil level. Oil level should not decrease unless oil seal is damaged or leaking. Replace if necessary.
GENERAL	Check mantle and concave rings for wear and cracks. Check space between head nut and bottom of spider to determine amount of wear.
	Check dust seal for wear and dust seal retainer for tightness to prevent breaking of studs.

MAJOR MAINTENANCE CHECK

Check all of the items on the Daily and Weekly Maintenance Charts
Disassemble the crusher and inspect the following:
Bottom shell for wear.
Bottom shell bushing for wear and scoring.
Bottom plate bushing for wear or scoring.
Tapered surface of bottom and top shell for movement or wear.
Top shell for wear.
Outside and inside bearing surface of eccentric for wear and scoring.
Shaft surface below and above crushing head – it should be smooth and without score marks.
Clearance between spider bushing and mainshaft sleeve – it should be less than 1/6 inch.
Teeth of pinion and drive gear for wear.
Step bearing and eccentric wearing plate for wear and scoring.
Piston and packing for wear – and packing for cracks.
Spider arm shields.
All seals for leaks. Replace if necessary.
While crusher is running, drop in pieces of lead at four different places around the crusher to check wear on the concave ring. If the four pieces measure the same after passing through, the ring is round – if not, the ring should be turned, or replaced if wear is excessive.

Safe **LOCK-OUT** Procedures

Above: The yard area pole switch and electrician's lock. These sub-station disconnect switches are important for areas where distribution panels are not available.

ANOTHER P&D EXCLUSIVE

IN the cement, quarry, and mineral aggregate industries electrically operated equipment looms as a major part of our daily operations and maintenance procedures. Likewise, the switches and pushbutton controls become equally important. However, the important phase of these operations, especially to safety-minded personnel, is the potential humanitarian hazard factor.

In reviewing the types of accidents generally occurring in our industries, I was startled to learn that many fatal cases and serious injuries result from failure to lock out switches. Although many articles have been written on the subject and practical mechanical safeguards are available, the human element still remains uncontrolled.

If we are to make progress during the "sixties," we must dig deeper into the practical application of many of our safety policies and procedures. Effective lockout practices will not only reduce accident occurrences but will materially cut maintenance and operating costs as well.

Following a series of costly accidents and two fatalities in my own company, the management gave top priority to the formulation of a company-wide program to study the problem and submit recommended control measures.

Safety Committee The committee formed consisted of the author as chairman, all plant superintendents, chief electricians, and safety leaders of some large plants. Also included were several top-notch maintenance men and the heads of our engineering department. This was a "top brass" committee, and it met many times to work out the following program:

Tackling The Job The committee first met and generally reviewed the problem. It was learned that:

a. All plants had some type of program, but none was tied down by a binding policy.

b. Very few of the programs were more than a token answer to the basic humanitarian causes of failure to use the lockout procedures available.

c. A company-wide engineering and purchase standard was lacking.

d. Training and follow-up practices were sadly lacking.

At the second meeting the committee, having previously been supplied with written data covering plant practices, began to "dig deep" into the problems; some of these were as follows:

a. Every plant did something different and with good reason.

b. There appeared to be more to correct than to create.

c. Some plants had very old equipment, with no distribution breaks. They were totally lacking in any distribution panels other than the main

Left: Typical stop and start pushbuttons normally found at all wheel pulleys. These can be very dangerous although the lockout stop button is provided as indicated in this picture. Stop buttons are important, but start buttons should be available only near the main switch or within sight of it. If this is not practical, lockout precautions must be carefully established and controlled.

By LEA P. WARNER JR.

Director, Public Relations and Safety, Warner Company

This article covers the basic essentials of a talk given by Mr. Warner at the National Safety Congress Exposition (Cement, Quarry and Mineral Aggregate Section) in Chicago last October. Because of the seriousness of accidents resulting from failure to properly "lock out" conveyors, bucket ladders, and other equipment, the quarry industry is confronted with a challenging problem. This is particularly true in areas where plants are spread out and belt operators become somewhat isolated. The unusual case history herein presented may answer a number of maintenance and operating problems.
—The Editor

sub-station. There were areas where the men would have to walk great distances in order to lock out a main disconnect switch.

d. Poor planning of previous owners and failures to follow safe and determined standards had been costly from an operating, as well as from a maintenance viewpoint. This, of course, was true from a safety viewpoint as well.

At subsequent meetings the company accident experience and the contemplated lockout procedures were reviewed to determine whether the new program would effectively counter any recurrences.

Case Histories I will briefly cover two of these accidents so that you may have some idea of the problems of the committee.

A group of men were standing on a conveyor belt in a tunnel painting the bin hoppers above. They could not be seen by anyone at the main disconnect switch about 250 ft. away. The head pulley was at the top of the concrete plant. A sign had been placed on the switch, but *it had not been locked out*. Why he did it we do not know, but one of the men pulled the main switch and 12 men were knocked off the belt, and paint was liberally splashed all over.

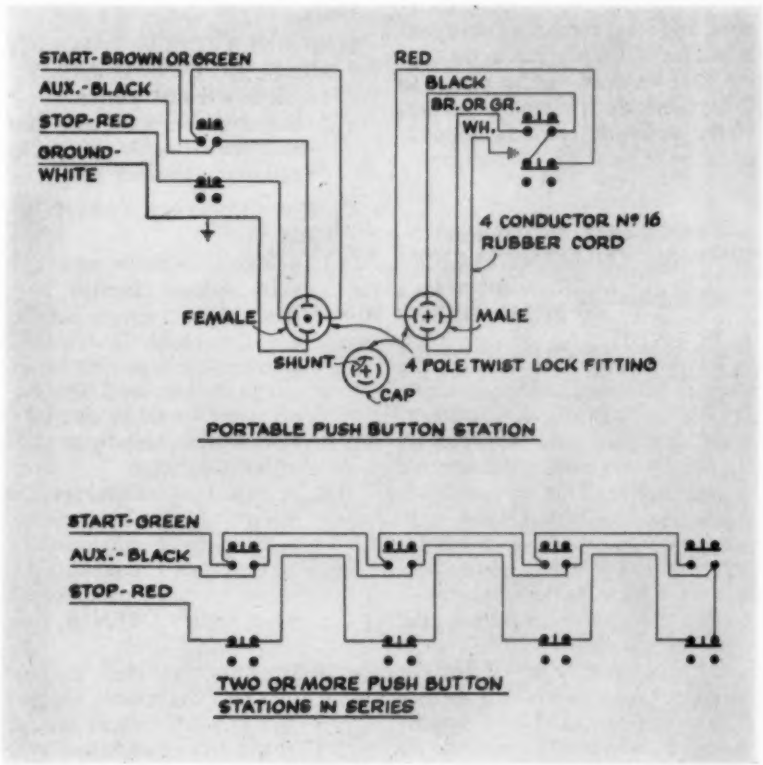
In a fatal accident described to this group last year, the lockout procedure failed. On a Saturday morning, the 300-ft. main conveyor from the quarry to the upper level crusher and bins was being repaired. The head pulley lagging was being replaced. At the same time, belt conveyor engineers were inspecting the lower end of the belt about 30 ft. at a time. The two jobs were worked together, and every 30 minutes or so, the belt was moved to a new position.

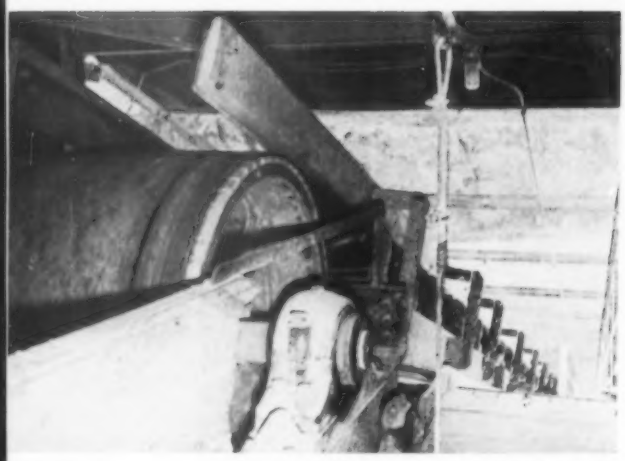
Right after one such move, the foreman had to answer a telephone call; the carpenter climbed on the belt at the head pulley area. (He had not placed his lock on the switch, probably because it was down a short set of steps and some distance away; it was too much trouble for a man of advanced years.)

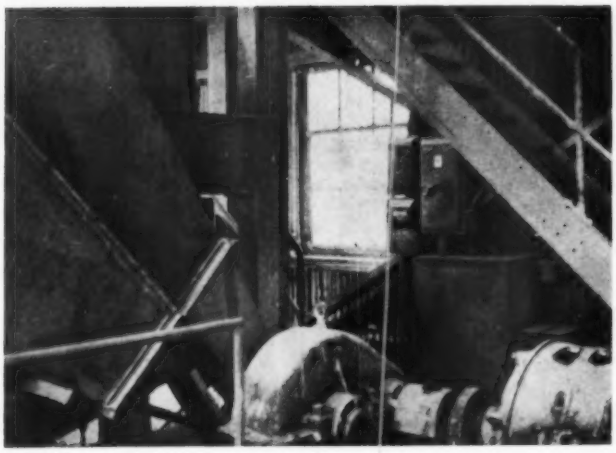
To show how the unexpected can upset well-planned procedures, at the moment the foreman left the belt, the engineers were not satisfied with the last movement of the belt, and requested another few feet. The operator above did not understand what they wanted. He went down the walkway, and upon getting the signal, hurried back up the walkway and pushed the button to start the conveyor, catching the carpenter.

Problems Preceding Agreement At this stage of our program, having prepared a rough draft of the proposed company standards, I was receiving individual letters regarding the costs and hardships involved in being forced to

Wiring diagram of the lock-out system used by the Warner Company.







Left: The head pulley of a 300 ft. conveyor. There are start and stop buttons on a column to the right and a stop button at the bottom of the conveyor. Right: Because the main switch was out of sight and beneath the stairs under the head pulley, the maintenance man failed to lock it out. He was killed when the operator—not seeing him—"jogged the belt" a few extra feet from the pushbutton station. The main switch should be near the head pulley; and in any event, an approved disconnect switch should be near the head pulley.

comply with such standards. These of course, constitute quite a file, so I will cover only a few letters. I will first present the final draft as approved and presently in operation. Then I will cover the comments that brought about such a standard.

Please bear in mind that many of of our member companies, associations, and other authorities were contacted for assistance; but in the end, the final standard had to be cut to fit the needs. Such a standard, as presented herewith (switch policy), might be of value to . . . others.

LOCK-OUT SWITCHES
WARNER COMPANY POLICY

Effective —— Corrected FINAL DRAFT

A. PURPOSE

To reduce to a minimum the chances of human failure resulting in serious injuries and accidents when machinery is accidentally started by workmen. Maintenance workers, particularly, are exposed to these hazards. Maintenance work follows no set pattern. Each job differs from every other, with no definite tie-in between operating crews, outside contractors, engineers, and other technicians.

It is therefore essential for our plants and yards to establish not only a basic safety (Lock-Out Switch) policy, but also a policy covering the locking of switches and the clearance to be given where two or more departments are involved.

It must be remembered that the policy is designed to prevent injuries. Any complications that develop in complying with these standards should be reviewed with the company safety engineer.

B. WARNER COMPANY POLICY SHALL BE IN TWO PARTS

1. **All new construction**
2. **Repairs, renewals, and general operation** of existing facilities per plant or yard.

C. NEW CONSTRUCTION POLICIES

1. **440-volt, 3-phase and 220-volt, 2-phase circuits**
   A main power supply panel of the Trumbull Distribution Convertifuse type with branch circuit shall be used. This supply panel should be entered or worked upon only by an authorized electrician.
2. **A combination starter and circuit-breaker** for each individual piece of equipment shall be provided. This unit has provision for three padlocks and when locked OPEN is absolutely safe.
3. **Pushbuttons** shall be used only where absolutely required, and in wet locations shall be of water-proof construction, so as to avoid shorting. These shall be designed to work in conjunction with each other, so that a failure of one unit automatically shuts down any other unit in sequence with it. (Locking-out of all pushbuttons not so designed shall not be permitted.) On new construction, pushbuttons must be of the 4-wire type.
4. **2,400-volt equipment—** The engineering department is now favoring E.C.&M. Valimotor type with manually operated (externally operated handle) disconnects built into the starter. These may be locked out by padlock. The opening and closing of this disconnecting switch may be safely done by the average workman in accordance with established policy and procedure. The E.C.&M. disconnects shall be so interlocked with the controls that it would be impossible to open them under load.
5. **Well protected conduit lines** should be carefully included in new construction work. It is recommended that they follow the main construction girders (those that seldom, if ever, are moved), placed along elevators, conveyors, etc., to facilitate repairs.

Pushbuttons and locked cov-

ers should be located in conduit at important inspection points along the elevator and conveyors in order to avoid use of portable cables.

6. **Low voltage lighting** (12-volt) and portable tool connections should be built into areas where tanks, tube mills, etc., are constructed or added to old buildings. (The Daniel Woodhead low-voltage equipment was recommended.)
7. **Third wire grounding** for all electrical equipment is recomended for all new construction. (It is generally agreed that this desirable feature can best be obtained by building it into new construction.)
8. **Labeling** of electrical equipment is essential and should be carefully and properly done in big letters. Standard company procedure should be adopted in order to avoid confusion. (*All* labeling could be done at one location if the machine is purchased.)
9. **General operating procedures** shall be as recommended under Section D.

D. REPAIRS, RENEWALS—GENERAL OPERATION

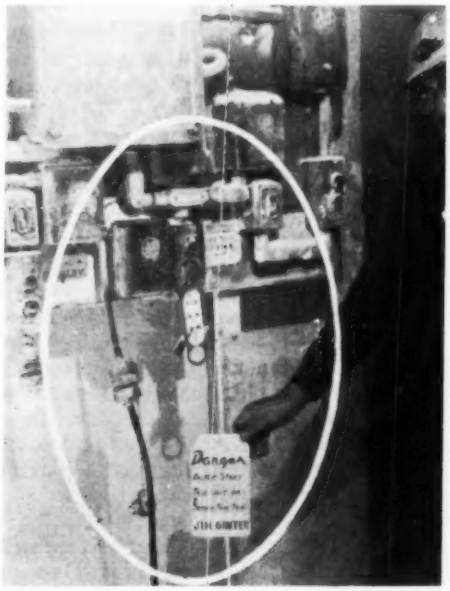
1. Where possible, all repairs and improvements must be in accordance with new construction policies and procedures.
2. Where (1) above cannot be carried out, the plans must have the approval of the engineering and safety departments.
3. All main switches must be locked out (disconnect switch above starter) when equipment is to be inspected, repaired, or replaced. Where these switches are not available except on a distribution panel, local plant personnel in charge shall be responsible for complying with the intent and purpose of the regulation.
4. The method of locking out shall be the responsibility of local plant personnel in charge, and each company plant may install its own procedure with approval of both the engineering and safety departments in compliance with the following recommended practices:
   a. The company shall furnish locks as required, and each lock shall be adequately identified. Where locks are painted various colors to indicate crafts covered, or to signify different shifts. *colors should be standard throughout the company:*

Operating department white
Electrical department blue
Machine shop and maintenance crews red
Supervisors, engineers, and others, brown

Where several shifts are involved, different shaped tags may be used, and/or shift numbers should be well designated on the tags.

   b. Each lock shall be numbered or a metal tag with the employee's name and other necessary information shall be attached to it.
   c. Keys shall be issued as required, but only *one* key per lock should be issued to an employee. Either the foreman or the superintendent should keep a master list of key numbers and the extra key to each lock in his department. Even though a workman's key may seem to be lost beyond recovery, the *supervisor* should not loan his key. If it is not found, a new lock should be installed.
   d. If two or more men are working on a job, each man should attach his own lock to insure his personal safety. In the case of groups of men working on one job, local rules, approved by the safety engineer, may apply.

The 4-wire hook-up for portable cables (see diagram, page 109) is illustrated here. When the portable cable is connected, it cuts out all other circuits automatically. The repairman places his lock on the main switch, just as the operating man does.



However, the maintenance man, as shown in this picture, can now move over to the bucket ladder being repaired. At this point he is out of sight of the main switch and can move the bucket for repair purposes. When the desired position is reached, the button can then be locked. This unit has a 4th wire for ground, as shown on page 109.

A cable (shown along the railing of the walkway) stretches the entire length of the conveyor. If the cable is pulled at any point, the main switch is disconnected, and no pushbutton starter on the line will activate the circuit.

This is the simple relay switch activated by the cable.

e. The only positive way to protect workmen is to lock out the main switch. However, where pushbuttons are the only source of lock-out control that can be used, they must definitely be of the 4-wire hook-up style or type.

Where pushbuttons are not fully protected with a 4-wire hook-up, **every starter,** regardless of voltage, should have an externally-operated disconnect switch or circuit-breaker ahead of it. The worker must adhere strictly to established local safety rules, and the supervisors must see that they are definitely lived up to. A short in the wiring, or tampering with the magnetic contactors could energize a lock-out pushbutton.

f. Where necessary, attach special lugs to switches and pushbuttons, so that they may be locked out.

g. When cranes, locomotives, and other electrically-operated equipment are tied up over a weekend, or when operated on a one-shift basis, all main or battery switches should be locked out.

h. No matter what method of locking out electric switches is used effective control can be maintained only by constant supervision and by training workers in the safe procedure to be followed.

i. Labeling of electrical equipment is essential and should be carefully and properly done in big letters. Standard company procedure should be adopted in order to avoid confusion.

j. All portable electrical tools should be grounded.

Comments Of Committee 1. All operating personnel and electricians were in favor of the engineering department's (new construction) recommendations. However, heads of most plants felt that even renewals in some areas would be most difficult. All renewal plans would have to clear through the engineering department and the director of safety.

2. All superintendents felt that new plants and equipment should be 100 percent correct before they took them over. From this time any further corrections would be charged to them. Thus, a well defined safety standard is of value to the local plant operating personnel.

3. Under C. 1 all members of the committee agreed that only an electrician should work on a main power supply panel; but there was the matter of the small plant operator who did not have an electrician on his payroll and at times had to enter the main supply panel area to check cause of trouble before sending for an electrician. An argument followed on just how far the small plant man should go, and it was finally agreed that when trouble might be checked back behind the main switch, an electrician should be called.

4. If you want to start an argument, bring up the subject of safe use of pushbuttons and jog buttons.

One member would suggest that if more than one pushbutton station is used to control one starter, the stop buttons should be connected in series. Therefore, locking out one of the "stop" buttons would prevent the unit from being started at any of the pushbutton stations.

Another man would say that it was too dangerous to depend on such arrangements. Water can always short

circuit the system. Perhaps we could use this system for one-man operations and never for repairs.

5. It was agreed that panel boards although locked, present some danger and should be serviced by experienced men. There is always the possibility of pulling the loaded block instead of the circuit considered dead. This, of course, is because the rated cut-outs all look alike, even though labeled and numbered.

Further, it was agreed that wherever it was absolutely necessary to depend on pilot lockout systems, the lockout should be at the source, that is before entering any of the components on the equipment concerned. Certainly 2,300 volt or 440 volt is not acceptable for pushbutton operation at any time.

6. At one plant the policy is to lock out controls, as there are no switches. At another plant the main controls are not always accessible, and they lock out the switches as the most practical approach. At this location three sets of keys for each lock are available. One key is given to the man responsible for all work on the equipment involved, one key goes to the foreman or the man working on the equipment, and the third key is kept in the office of the plant superintendent. A color coding system would be used.

7. One plant maintenance man reported that two mills have poor, antiquated equipment. Present switches are the open knife-blade type, not enclosed, of low interrupting capacity, and must be operated with a pole and strap. The starters would need chains and a hasp. In this instance, new equipment was ordered.

8. Most electricians and safety men bluntly state that the main switch must be locked out. However, to be practical, let me give you a few paragraphs from a plant electrician who feels that pushbuttons can be made satisfactorily safe:

"We have in practice what is generally known as a centralized control, which consists of a panel accommodating the P. B. stations, ammeters, starters, and a few disconnect switches controlling all the units of the department from this one point. This also requires the installation of additional P. B. stations on some of the units to operate at other locations where control of the unit is necessary.

"The units designed to work in conjunction with each other are connected in such a manner that a failure of one unit automatically shuts down any other unit in sequence with it.

"There is no distribution panel in our plant, and for that matter any plant that I have ever seen, where facilities for looking out the switch in the panel is provided for. Coupled with this is also the hazard of a man pulling out the wrong switch and thinking he is safe, but he still is not, even though the switches in the panel are well marked. There is also the possibility of pulling a switch out in error for the one intended and breaking a heavy current to a unit in operation, causing a flash. I have seen both of these things happen to men who are accustomed to working in distribution panels.

"For these reasons I have recommended that it is far safer to lock out a P. B. control station, or the starter itself if it is different from a magnetic contactor, instead of the disconnect switch itself. . .

"This brings us up to the recommendation I have made for locking out pushbutton control stations—to neutralize the unit so that it cannot be accidentally started. This type of control seems to be the only one in question, since all manually operated controls in the plant have locking devices integral with the starter. (See attached wiring diagram.)

"The next objection, as I understand it, is from the fact that a falling object of some kind could possibly rupture a control cord such as is used in our plant at the present time, causing it to go to ground and start up the equipment controlled by the cord. The only answer I can give here is that we have had these cords in service at this plant for a good many years. It must be understood that the only time these cords are in service is when the Repairmen are making repairs or checking their equipment, chiefly elevators.

"The P. B. station on the end of the cord is of a type that can lock out the unit being worked on and also carries a ground wire for the operator's protection. . .

Now, everything should work out perfectly, but let's be honest. Unless your company operates on a specifications basis where every department head pulls out the manual when he designs, buys, builds, or operates, policies soon get side tracked. By side tracked I mean the details for application. New heads of departments, changes in basic company methods of operation, accounting systems, all tend to weaken previously established policies. This is particularly true in the medium and small-size plants.

For this reason, I think that the big challenge in safety for the "Sixties" will be to dig deeper into the basic procedures and endeavor to make them part of our operations, regardless of management changes in policy and personnel.

Ideal Cement Plant at Okay Celebrates 30-Year Mark

Thirty years of operation were recently completed by the Ideal Cement Company plant at Okay, Ark. More than 30 million barrels of portland cement have been produced at the facility since it went into production.

The plant at Okay has more than doubled in size, and now has a capacity approaching 2 million bbl. annually. Numerous improvement programs have been completed at Okay. Last year a new mill and other equipment were added. The latest improvement was the addition of high-speed truck-loading facilities, supplementing the rail-loading terminal.

Labor relations at Okay are a point of pride with the plant's officials. There has never been a strike. Many of the employees have been with the company more than 20 years, and 13 of the men who were on hand to put the plant into operation 30 years ago still work there.

LYSLE FREW, recently joined the staff of Giant Portland Cement Company, Philadelphia, as a sales technician. In his new post he will serve the highway construction industry in eastern Pennsylvania. He was previously a field representative for the Associated Pennsylvania Constructors, and earlier had been associated with the Pennsylvania Turnpike Commission.

Is it worth the time and money? How can you

Get the Most Out of Conventions?

By HAROLD J. ASHE

ATTENDING a trade association convention requires no special skills, so far as extensive observation has revealed. In fact, about the only qualifications are membership, time, and money to defray expenses. Organizational loyalty is a factor, too.

However, getting the most out of a convention is something else. This is an art too seldom practiced. If it is neglected, conventiongoers are impoverished, rather than enriched.

Regardless of the cynical observations and written commentaries on trade conventions, their primary purpose is to enlighten and educate those in the industry. Usually, this objective is reached. That is, the enlightenment and the education are there for those who are ready to receive them. However, if the receptiveness of delegates is negligible, the best laid plans and most brilliantly conceived programs of association officers will be of little avail.

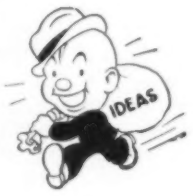
The uncritical may judge the success or failure of a convention by outward evidence. If those attending sit on their hands when rousing applause is in order, the members of the arrangements or program committee may feel their labors have been in vain. However, the real test of the success of a convention is what the delegates get out of the meeting to take home and *use*. The convention management group can't do much about this. The benefits derived are up to the conventiongoers.

The truth of the matter is that some delegates go to a convention with a "show me" attitude, although this feeling may not actually be voiced. They are neither "shown" nor disappointed. For them the convention is a bust.

Just as in a good many other human relationships, an individual gets out of a convention just about what he puts into it. The hard chairs of the convention hall may paralyze his posterior; unreceptive mind-set is just as likely to deaden his mind. Conditioned reflexes may make him put a cigarette stub in a saucer, doubling as an ashtray, but the same reflexes fail miserably in conveying business-building ideas to his nonconducting cranium.

Long before a delegate goes to a convention, he should give at least some thought to what he hopes to get from the convention for which he is laying out good money. First of all, there are the *problems which beset the entire industry*. He expects these to be discussed intelligently, perhaps by the keynote speaker, and possibly, with practical solutions.

However, regardless of the convention program, high on the agenda of the individual should be *his own nagging, unanswered problems*. Having exhausted his own efforts to find a solution for the troubles, he may consider the convention his last recourse. At this point his ability to get the most out of a convention is put to its greatest test.



Since convention programs cannot be set up to consider each individual's problems, he must attempt to solve his problems by whatever means are offered.

How can this be done? First, by formulating his problems so that he knows exactly what they are. A surprisingly large number of delegates confuse unsatisfactory results with causes. It is important to state the problem (or problems) factually and accurately. Emphasizing the wrong symptoms will result in an incorrect diagnosis and an ineffectual prescription.

Next the conventiongoer should know when to present his problem and where to seek an answer. During discussion periods, questions and problems should be directed to speakers and others who are most likely to have knowledgeable answers. A producer who has been confronted with a comparable problem and who has overcome it may be far more competent in this field than a score of others, to whom the problem may be purely academic. The carefully attuned ear will sense whether the answer is based on experience or on theories.

The convention program should be studied carefully. If the printed program is not sufficiently explanatory, an effort should be made to find out who's who and what's what. If one or another of the sessions must be missed, the member should

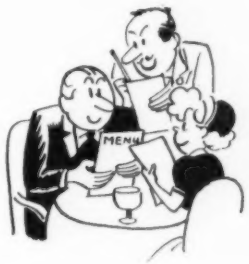
make certain that he skips only those least likely to be particularly enlightening to him. Playing hookey should not be indulged in indiscriminately.

If a delegate's time is limited, he had better arrive early at the convention and leave early than arrive late and leave late. Enthusiasm, like other efforts, has a way of running down. Early arrival permits making early friendships and exchanging valuable experiences which time and convention events will not permit later on.

If panel discussions are part of the program, with two or more running concurrently, it is well to find out in advance which discussions are more likely to be most helpful in the light of the individual's own needs, experience, or method of operation.

In any general discussion from the floor, a delegate should be prepared to speak freely out of his own experience. In thus stimulating and broadening the participation, he not only gives others the benefit of his own background, but he also benefits from it. His comments spark ideas among others, and the ensuing exchanges greatly enrich all.

A member should not hesitate to make notes of convention proceedings and discussions, perhaps with memoranda indicating who said what. These should be made on the basis of usable ideas which can be worked out in the delegate's own business, either as is or with modification and adaptation. Frequently, a point barely touched on can be



profitably pursued between sessions in connection with the speaker who mentioned it.

A delegate should mingle with others and try to make friends with those from communities other than his own. He should not be clannish or cling to his own local group. A delegate can meet with his local competitors at any time, but often those far-removed members are the ones from whom he can get the most worthwhile help, including practices and attitudes that may be new in his own locality. These informal meetings may open up entirely new vistas not seen at the local level, where a producer may imitate others and only rarely launch any new or important product.

Some of the most invaluable ideas and helps that can spring from a convention are traceable to these informal meetings, some of which result in lifelong friendships. These conversations need not be limited to the convention hall or corridors; it is much more likely that they will be held at the dinner table in a quiet restaurant between or after sessions, or over a cooling drink after a hectic committee meeting.

A convention delegate can make the experience of meeting fellow members as rewarding as his own resourcefulness dictates.

New Accident Prevention Book Available from N.S.C.

The fourth edition of the National Safety Council's *Accident Prevention Manual for Industrial Operations* has been published. Billed as the most complete and informative safety reference work in existence," the manual draws upon the knowledge of safety men from nearly 7,000 firms, encompassing every U. S. Industry.

The manual contains more than 500 illustrations and 1,542 pages of up-to-the-minute safety data. Single copies may be obtained at $15.50 from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.; quantity rates are available.

Safety Programs Prove Worth—Cut Injury-Frequency Rates

Company safety programs are indeed a worthwhile effort, according to *Industrial Relations News*. They reduce injury-frequency rates, as intended, according to a comparison of National Safety Council statistics with those compiled by the Labor Department's Bureau of Labor Statistics.

The N.S.C. figures—based mainly on companies sponsoring safety programs—are significantly lower than those compiled by the Bureau of Labor, which were based on a sampling of companies with *and* without safety programs.

For example, the B.L.S. sampling of companies in machinery-making showed an injury-frequency rate of 11.7 (disabling injuries per 1,000,000 man-hours of work), while the N.S.C. survey of companies with safety programs in the same industry produced a figure of 6.0.

Near Zag, Ky., the new plant of the Licking River Limestone Company recently went into production at the current capacity of 200 t.p.h. This rate reportedly can be increased to 300 t.p.h. if necessary. The entire operation of the plant is pushbutton-controlled.

3M Office Building Completed As 7th Unit in Expansion Plan

A 14-story office building opened recently at the site of Minnesota Mining and Manufacturing Company's research center east of St. Paul is the latest unit completed in that firm's long-range expansion plan. Seven buildings now have been erected. Additions and two other new buildings are now under construction.

3M's plan, begun ten years ago, envisions a building complex which will include laboratories, pilot plants, services and office buildings, and related structures.

Nic and Harvey Schmitz are the new owners of the two gravel pits of the O. & W. Gravel Company at Newburg, Port Washington, Wis., which were formerly operated by Arno and Joe Ubbink. The Schmitz brothers also operate ready-mix plants at Port Washington and Thiensville, Wis. The new owners will continue operating the gravel plants with the same personnel.

Permanente removes "load" from producing mills by

versatile bulk loading from centralized plant

WITH varied construction activity resurging in most parts of the country, dependable delivery of cement in a variety of carriers is a phase of the industry's operations and services which is growing in importance.

Differing requirements of construction projects supplied by a given cement mill present a major problem, since the producing facility must have available the loading equipment required by the carriers designated for delivery.

An increasingly popular solution is the establishment of a centralized station which incorporates loading facilities to serve more than one mill. Another significant factor is that a centralized station eliminates the need for large capital expenditure in equipping each individual producing plant with loading units.

The Permanente Cement Company has constructed a central bulk-loading station of this type at Long Beach, Calif., which duplicates for southern California the firm's pattern of flexible cement distribution provided in its other West Coast operations. All centralized equipment is available in the Long Beach facility for bulk-loading and unloading of railroad cars and ships, barge loading, and automatic bulk truck-loading. Silos at this site are supplied by rail shipment from the firm's southern California mill, or by ocean vessels from other Permanente plants to the north.

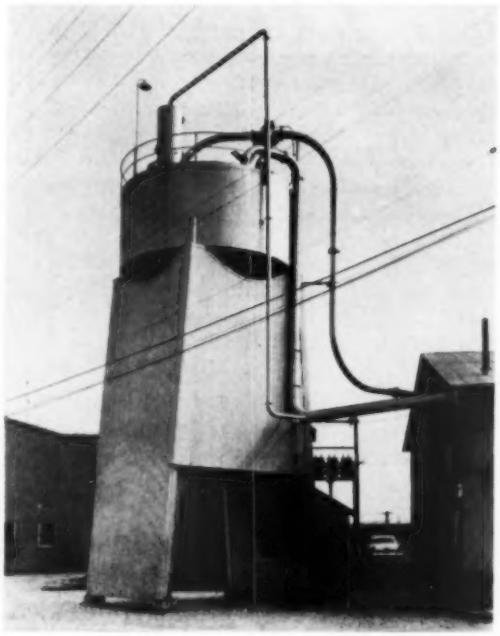
A 6,000-bbl. capacity is provided in each of the 10 storage silos at Long Beach. Cement brought in by rail is rehandled at the siding by a track-hopper screw conveyor and bucket elevator, the latter discharging into the hopper of an 8-in. type H Fuller-Kinyon pump which delivers the material to the silos. A track was installed below each of the two rows of five silos to carry a roller-bearing flatcar. A 10-in. type H F-K pump, which with its motor weighs about 10 tons, is mounted on the car. Two men, however, can readily push the unit to any desired loading point below the silos.

Five chutes below each silo can discharge directly into the pump hopper. The flow, through manually-operated gates, can be rapidly switched from one chute to another, which allows complete discharge from a silo, and also preliminary aeration of the material.

Primary lines are installed for pumping 920 ft. from the silos to the ship- and barge-loading dock, and 620 ft. to the truck-loading station. Each of these 10-in. lines has a rated capacity of 1,000 bbl. per hour. At the dock, flexible connections were installed to accommodate the water transportaion units. The system can unload ships at the rate of 2,000 bbl. an hour, and load them at 1,500 to 2,000 bbl. an hour. Barges, of 25,000-bbl. capacity, are loaded at the rate of 1,000 bbl. hourly.

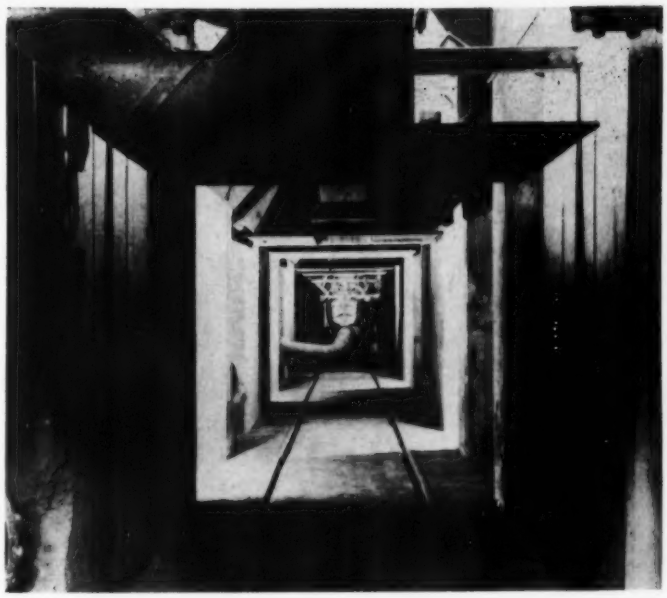
Air is supplied for this operation by a pair of C-300 Fuller rotary vane compressors that can deliver 3,800 c.f.m. of air at 40 p.s.i. Drive is provided by a 400-hp. Fairbanks-Morse motor.

The self-contained bulk truck-loading installation is comprised of a 2-compartment, 1,000-bbl. storage



The automated bulk truck-loading station is comprised of a 2-compartment, 1,000-bbl. silo, a weigh tank, a weighing-recording unit, and a control booth. Cement is supplied to this station through a 10-in. line from the ten main storage silos.

A view under one of the two lines of five silos. Two men can easily position the roller-bearing flatcar, with a 10-ton load of cement pump and motor, below any silo. Each silo has a storage capacity of 6,000 bbl.

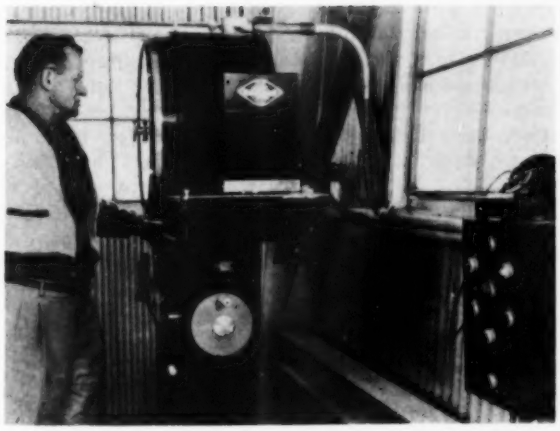


silo mounted above a truck drive-through, a weigh tank, a discharge line, and a control station. Operated by one man, this loading station can accommodate eight 150-bbl. bulk trucks per hour. The two silo compartments contain different types of cement, and each discharges into the weigh tank through a separate gate.

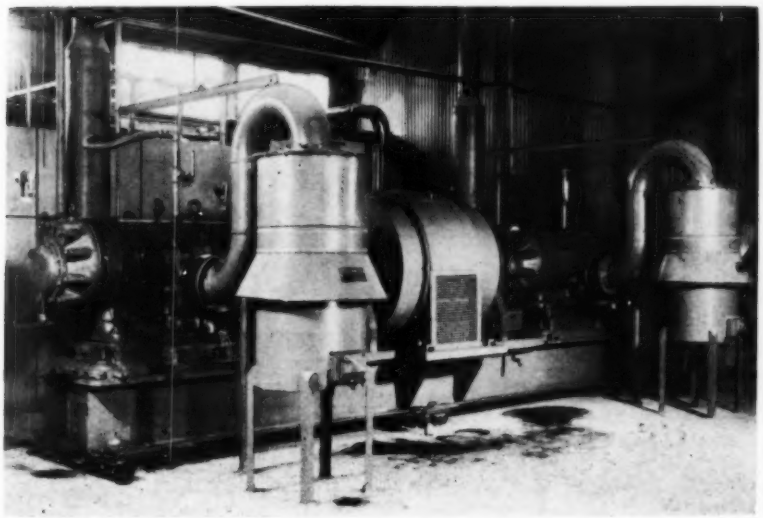
A pre-determined amount of cement is drawn from the compartment selected by setting the amount desired on a Fairbanks-Morse Printomatic weigher and then actuating a control button. When that amount has discharged into the weigh tank, the weighing recorder automatically makes a printed record of the weight, date, and time.

The pumping line used to supply the bulk truck loading station is provided with a by-pass through which cement may also be furnished to storage bins for bagging. At the top of the truck station a remote control Fuller valve diverts the flow into the appropriate silo compartment. An industrial-type vacuum cleaner system is also provided to keep truck tops clean during loading operations.

In the bulk truck-loading control booth, the operator sets the desired weight on the scale. This amount is then automatically weighed out, and the unit makes a printed record of the weight, date, and time.



These two compressors, driven by a single 400-hp. motor, provide air for the primary pneumatic conveying and distributing systems.



Fire Safety Booklets Issued By National Safety Council

Two new pamphlets have been issued by the National Safety Council: *Before It's Too Late!* and *Fred Flame, the Fiery Delinquent.* The former, a 12-page booklet, is dedicated to "all the brave firemen who try to arrive before it's too late." It is an off-the-job safety aid.

The second is a 16-page illustrated pamphlet dealing with industrial fires. A single copy of each booklet may be obtained free of charge by contacting the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

New aggregates plant serves Vancouver, B. C., area with 300-t.p.h. potential

By HARRY F. UTLEY

ANOTHER ON THE SPOT report

HELPING to supply the booming market for concrete aggregates in the Vancouver, B. C., metropolitan area is a new and independent producer, Construction Aggregates, Ltd. Company headquarters are in New Westminster, a Vancouver suburb, and the pit and plant are located at Brittania Beach, several miles up Howe Sound, north of Vancouver. The plant was erected in two stages, and initially processed only natural gravels and sand.

Recently a crushing department was added, and output currently is running about 225 t.p.h. Additional equipment to be installed soon will bring capacity to the 350-t.p.h. mark.

When the plant first went into operation, the only transportation between Brittania Beach and Vancouver was by water; so men, machinery, and materials had to be carried by boat and barge. Since then, however, a railroad and a modern paved highway have been built, skirting the eastern shore of the sound, and shipments now may go out either way.

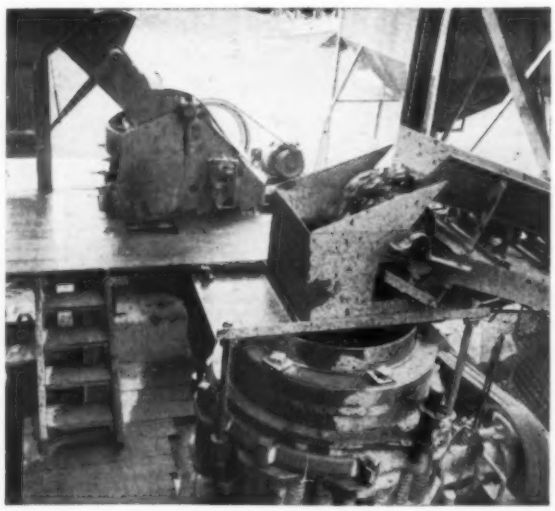
However, most of the finished products of Construction Aggregates are still barged into Vancouver waterfront or to wharves along the Fraser River for delivery to dealers and distributors. A loading conveyor extends out from the dock at Brittania Beach to fill the scows, which can carry up to 500 tons.

The deposit is on the landward side, and the processing equipment is strung along the Brittania Beach waterfront. A belt conveyor crosses over the highway from the receiving hopper to the plant screening tower. The deposit, of glacial origin, is high-grade material; it is relatively clean, and has a desirable gradation. The pit is worked as a high bank, which is caved and excavated by a 3-cu. yd. dragscraper with a 2-drum hoist pulling the bucket.

At the 15-ton-capacity receiving hopper the material is discharged over a rail grizzly spaced at 4 in. Grizzly rejects, of which there are very few, are wasted; and a reciprocating-plate feeder puts the pit-run on a 30-in. by 250-ft. road bridging conveyor running up to a 4- by 12-ft. Overstrom primary 2-deck screen.

Plus 3-in. top-deck rejects pass to a 10- by 24-in. KueKen jaw crusher set to break the oversize to minus 2½ in. Lower-deck rejects, in the 1¼- to 3-in. bracket, are chuted to a 180-ton surge bin (as is the primary-crusher product). This bin feeds the secondary crusher, a 3-ft.

Primary rejects are broken down to size by the 10- by 24-in. jaw crusher and the 3-ft. cone crusher.



Below: Water depth allows barges to tie up close to shore for loading near the conveyor.

An overall view of the plant of Construction Aggregates, located on the shore of Howe Sound, near Vancouver, B. C. The pit in the foreground is worked by a dragscraper. The conveyor which delivers to the plant crosses over both the highway and the railroad.

Symons standard cone, in closed circuit with the screen. Minus 1¼-in. gravel and sand screen throughs are conveyed to the sizing screen and other sand-making equipment.

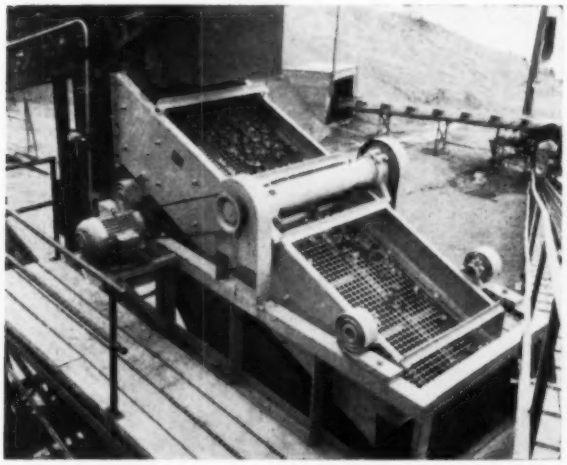
Finished gravel (natural for the most part, but containing some crushed particles) is sized and washed on a 4- by 12-ft. Overstrom triple-deck screen. Sand and water are flumed to Eagle Iron Works washing-classifying-dehydrating equipment at ground level. From three to five sizes of gravel within the limits of ¼ and 1 in. are usually produced.

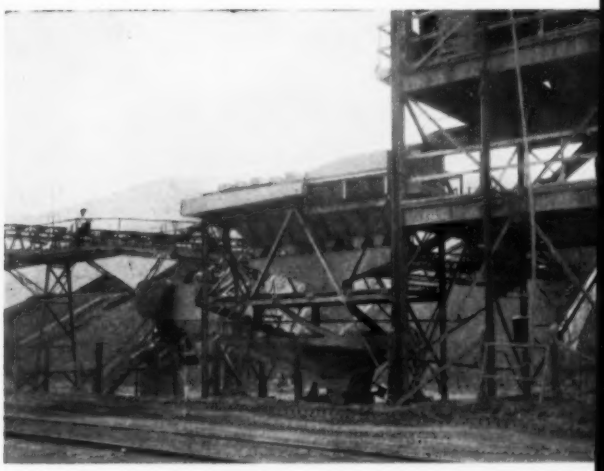
The 100-percent crushed material, normally a minus ¾-in. product in demand principally for road work, is separately sized over a 4- by 12-ft. Overstrom single-deck screen and separately stockpiled. However, gate arrangements provide for a high degree of flexibility permitting production of almost any size, blend, or combination of materials, crushed and uncrushed.

Sand and spent water are flumed into a six-compartment Eagle scalper-classifier tank with automatic bleeder valves and splitter gates. The blending and collecting flume beneath the six sizing cells feeds to

(*Continued on page* 124)

Below, left: This crushed material finishing screen is one of the three sizing units in the plant. Below, right: The sand department consists of a 6-compartment water-scalping tank with the collecting flume and a single-screw dewaterer immediately below. At present only concrete sand is produced.





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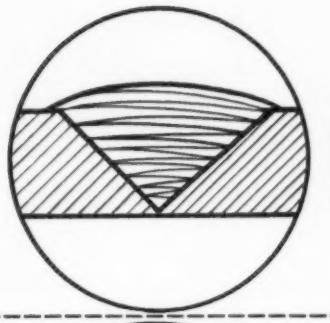
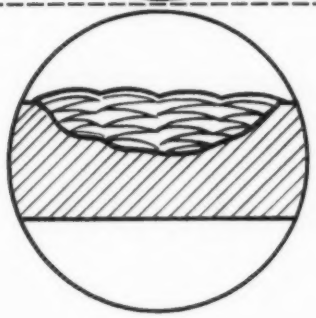


FOR JOINING



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Elongation in 2"	55%	37.5%

Hardness—Single pass on manganese steel;
as deposited—15 Rc, as work-hardened—48 Rc.
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as deposited—18 Rc, as work-hardened—48 Rc.

*Be sure that your Maintenance Superintendent and Welding Foreman see this announcement!

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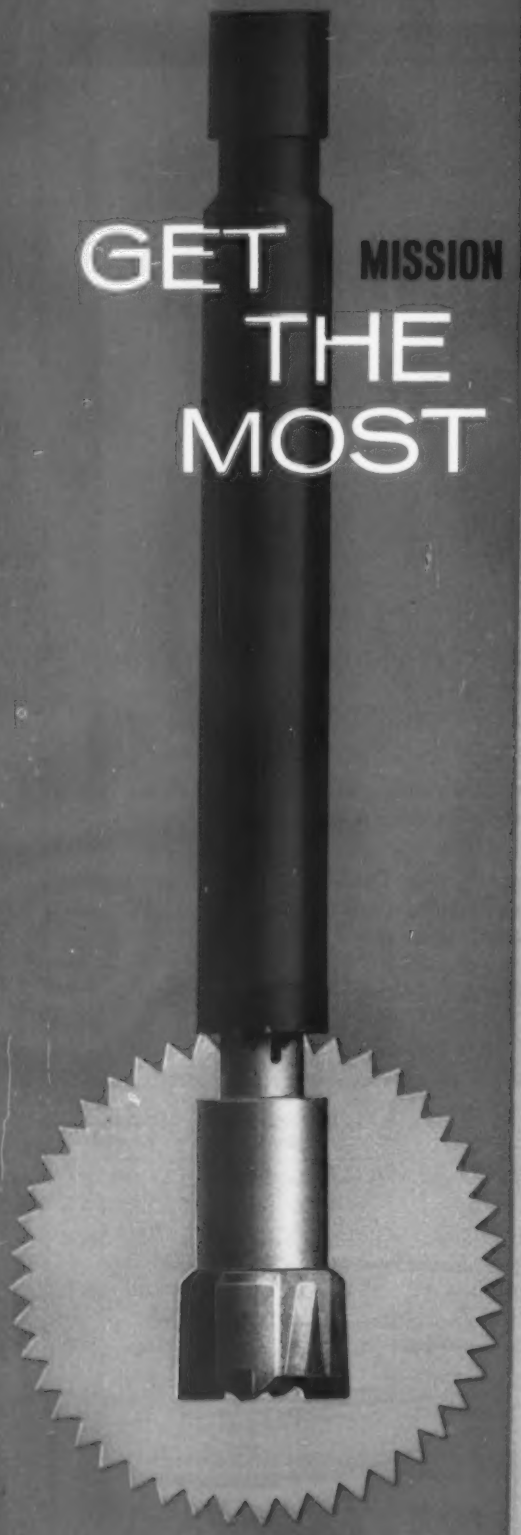

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comprehensive technical program presented at A.S.T.M. Pacific Area Session

Frank L. LaQue

NO MEETING in the history of the American Society for Testing Materials has been so illustrative of this orgranization's broad scope of activity as its third Pacific Area National Meeting, held in San Francisco, October 12-16, 1959.

Although emphasis in many sessions was focused on the extreme environments which materials are now required to withstand in an age of rockets, jets, missiles, re-entry nose cones, atomic power plants, and high-temperature industrial uses, some sessions directed attention to far different but no less important problems of materials for our nation's airports, highways, dams, industrial plants, homes, and waterfront structures.

Other groups concerned themselves with radiation, spectroscopy as an analytical tool, utilization and disposal of industrial water, air pollution control, and other equally urgent problems. The second Nuclear Problems Forum provided industry with a chance to trade views and be brought up to date on what the society's committees are doing in this important field.

Although total attendance at the meeting did not reach preliminary estimates, more than 1,300 persons registered during the week—619 members, 187 committee members, and 495 visitors.

The highlight of the week was the president's National Luncheon honoring Frank L. LaQue, at which Lieut. Gen. Bernard A. Schriever was the guest speaker. President La Que's remarks, entitled *A.S.T.M. Materials and Progress,* emphasized the theme that progress depends on advances in materials. "Everyone present can instantly bring to mind," said Mr. LaQue, "some scientific or engineering development that has been, or still is, dependent on improvements in materials." To illustrate, he observed, "Further Advances in the economical generation of power from nuclear sources will be determined more by improvements in materials and the way they are used than any solution in the realm of atomic physics.

"The extent to which man will be able to journey into outer space and especially to return safely," he continued, ". . . will be controlled principally by the solutions of materials problems."

General Schriever, commander of the Air Research and Development Command, in his address on *Materials in the Aerospace Age* underscored the heavy dependence of the Air Force on the perfection of new materials in everything from conventional aircraft to rocket motors and re-entry cones. He stated that A.S.T.M. standards comprise an integral part of many military specifications and many Air Force procurement contracts directly recommend adherence to A.S.T.M. standards. He urged continued voluntary activity on the part of A.S.T.M. in research and standardization of advanced materials.

The exhibit of testing apparatus and laboratory supplies was an important educational adjunct to the meeting. About 35 booths were occupied by 28 exhibitors, who displayed a wide variety of apparatus. Visitors were particularly interested in the many new devices shown. More than 600 registered to visit the exhibit alone.

Radio-Isotope Test Methods With the availability and knowledge of radio-isotopes increasing every day in American industry, it is only a matter of time before A.S.T.M. will adopt standards and test methods for their use. The symposium on applied radiation and radio-isotope test methods was held to focus attention on several procedures using radio-isotopes that might be adopted as A.S.T.M. standards.

One major problem in the cement industry is the chemical analysis for magnesium. The standard magnesium analysis takes 28 hours, most of

← Enter 122 on card, page 169

which is needed for digestion, filtration, ignition, and weighing. The portland cement industry, which depends upon chemical analysis for quality control, needs a more rapid test. Battelle Memorial Institute has developed a procedure using the basic method, but labeling the ammonium monohydrogen phosphate with phosphorus-32. This method permits making a direct determination of the amount of precipitate formed without carrying out digestion, filtration, ignition, and weighing. Using this procedure, one can analyze for magnesium in less than an hour.

Road, Paving Materials Durability is the most important property of paving asphalts to the engineer. As part of a program to determine performance under field conditions, the California Division of Highways introduced specifications for paving-grade asphalts, and at the same time initiated the Zaca-Wigmore experimental asphalt test project.

Ten different asphalts were placed on this major construction project, all of which were produced in California except one, an Arkansas product. The test information from this project was presented during a road and paving materials symposium.

Two papers were presented by representatives of the California Division of Highways: F. N. Hveem, Ernst Zube, and J. Skog. W. C. Simpson, T. K. Miles, and R. L. Griffin, Shell Development Company, discussed the correlation of the microfilm durability test with field hardening observed in the project. The authors from the California Division of Highways Department concluded that the performance of the Zaca-Wigmore test road to date clearly shows that asphalts produced from different crude sources and methods of production can have various degrees of durability under equivalent conditions of traffic and climate.

The co-operative test series confirmed the need for continued study of the variables involved in the test. The microfilm durability test gave results showing good agreement of the progressive hardening of the asphalts in the road during a three-year period with the increases in viscosity found in the test.

It was also noted that pavements with high void content hardened more rapidly than those with low void content, and that hardening of asphalts by loss of volatiles can be controlled by selection of crudes or by applying distillation and blending techniques so as to keep the 10 percent distilled point at or above 400 deg. C converted to atmospheric pressure.

Carl L. Monismith of the University of California, Berkeley, reported on an investigation of the effect of temperature on the flexibility characteristics of asphalt paving mixtures. Results seemed to justify the bsaic philosophy of asphaltic design; *i. e.*, include in the mixture as much asphalt as possible to insure durability and flexibility, but not so much that load carrying ability is reduced.

Fritz S. Rostler and Richard M. White reported data to show that chemical composition of asphalts is better defined by a precipitation method than by analytical procedures based on solution and/or absorption equilibria, and that physical, including rheological, properties of asphalts and changes of these properties during weather can be correlated with changes in chemical composition.

Degradation of mineral aggregates, particularly in base courses under flexible paving mats, is a natural process that results from the kneading action of moving wheel loads, according to Martin Ekse and Henry C. Morris of the University of Washington. Over a period of time heavy traffic will tend to produce not only a progressively finer general aggregate grading than was initially placed in the base course, but also an excess of fine material in the particle-size range of silt and bordering on that of clay.

As a result of such degradation of base course aggregates there is reduction of angularity and interlock of the coarser particles and also some "lubrication" of the coarser particles by increasing amounts of fine material distributed through the aggregate under moist conditions. The net effect is to reduce the stability of the base course. The paper of Messrs. Eske and Morris reports an attempt to establish an effective and practical test to evaluate this tendency of a mineral aggregate.

Carl E. Minor, Washington State Highway Commission, described a simple abrasion test which he recommended for further study to reproduce fines similar to those found in degradation of roadways.

Construction Aggregates

(*Continued from page* 119)

a 36-in. single-screw Eagle dehydrator. Only concrete sand is currently being made, although the equipment can easily be adapted to produce other gradations.

Finished aggregates are conveyor-stockpiled over a 250-ft. tunnel housing a reclaiming conveyor which can deliver to the barge-loading equimpent, or to rail- and truck-loading bins. A separate reclaim conveyor ties into the loading line from a tunnel beneath the crushed gravel stockpile.

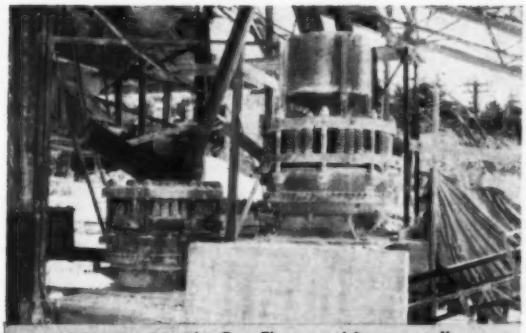
Water for aggregate washing is purchased as surplus from the power plant of the Howe Sound copper mine, which adjoins the aggregate plant property. It is piped about ¼ mile to the aggregate plant under pressure. Plant requirements for washing are about 600 g.p.m.

About 10 men are on the payroll, including maintenance and supervisory personnel. Erik Scholefield is president and secretary of Construction Aggregates, Ltd. Harry Stirland is engineer and general superintendent.

1st Fleet Maintenance Show Scheduled in N.Y., Oct. 24-27

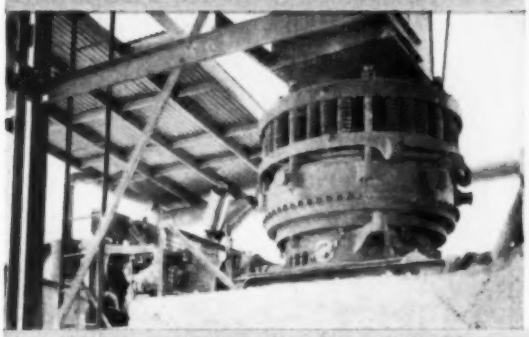
A new kind of automotive show —built around the interests, problems and needs of the fleet owner and operator—is scheduled for the Coliseum in New York City on October 24-27, 1960. This First Fleet Maintenance Exposition will combine 150 industrial exhibits with a program of five workshop sessions.

A study made among truck users revealed that items fleet owners want to see exhibited include trucks, passenger cars, bodies, tires, batteries, transmissions, brakes, petroleum products, shop tools, etc.

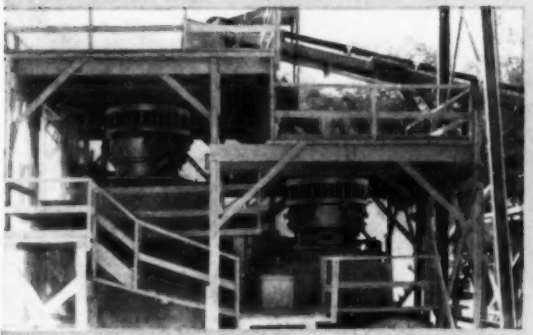


Vermont Marble Co., Florence, Vt., are well satisfied with their 36-S and 36-FC Gyraspheres.

This 48-S Gyrasphere turns out top tonnage for International Lime & Stone Co., Chazy, N. Y.



Crushing granite at Lunenburg, Mass., this 36-FC Gyrasphere is doing a fine job for P. J. Keating.



Fitzgerald Bros. Construction Co., Troy, N. Y., like their 48-S and two 36-FC Gyraspheres.

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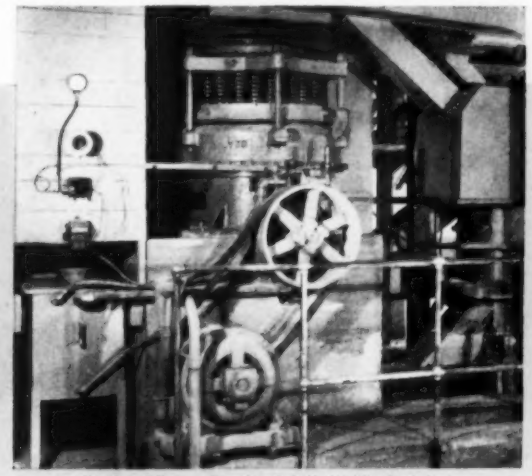

Y-20 1059

Cortland Stone Co., Peekskill, N. Y., find their 24-S Gyrasphere very efficient.

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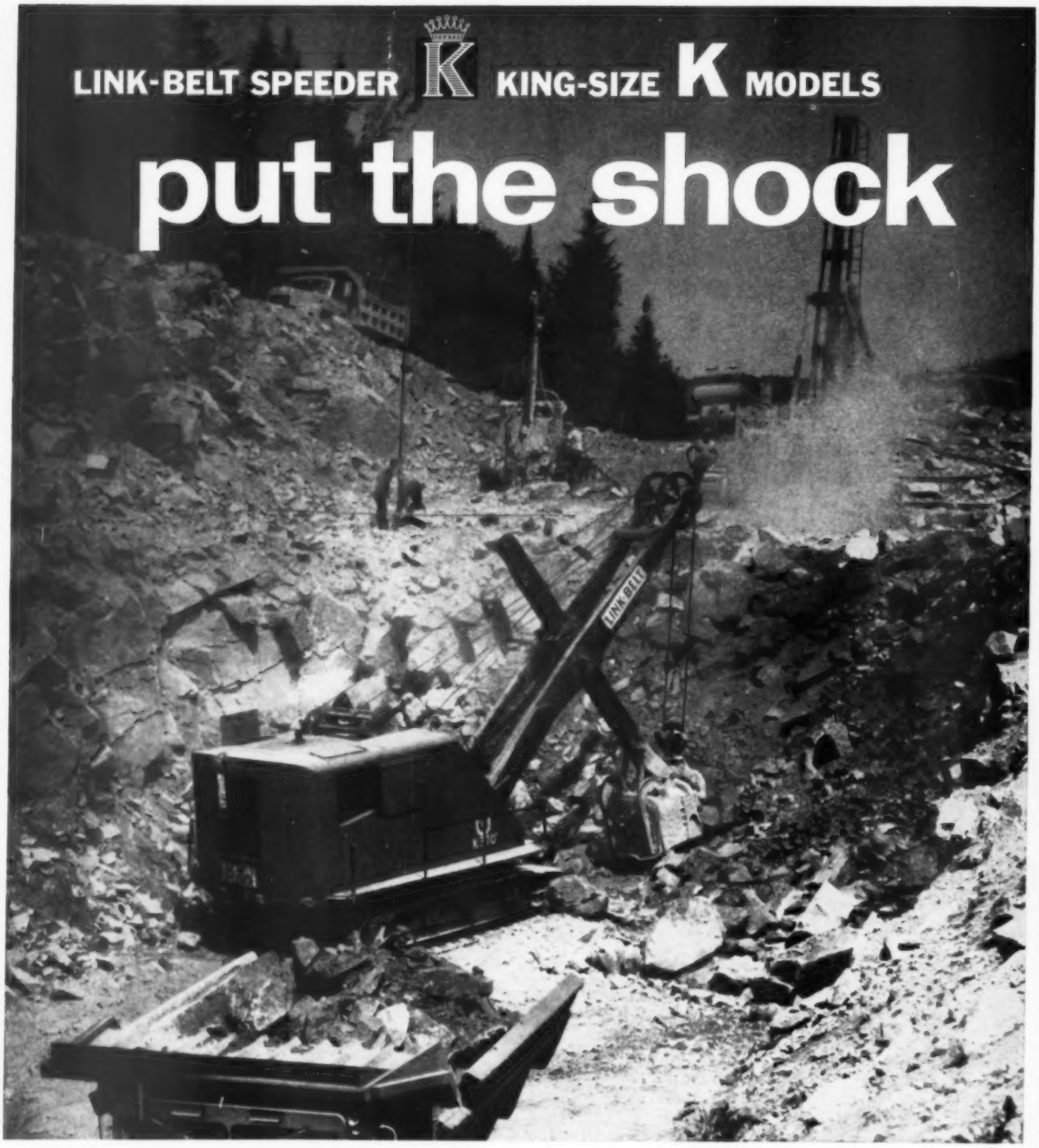
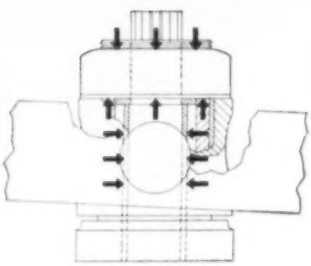
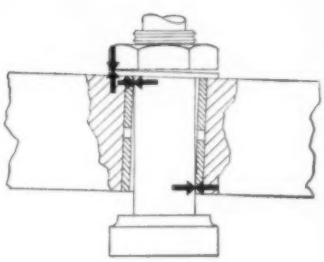


THIS—Link-Belt Speeder rotating base is trunnioned to the centerpin. Despite tilting action of the upper, there's perfect alignment of the centerpin and the bushing, plus full-length distribution of loadings to minimize stress and wear on centerpin.



NOT THIS—Without exclusive centerpin trunnion, tilting action of the base causes concentrated bending forces on the centerpin and prying action on the centerpin nut. Result is gouged centerpin bushing when swinging . . . repeated repairs.



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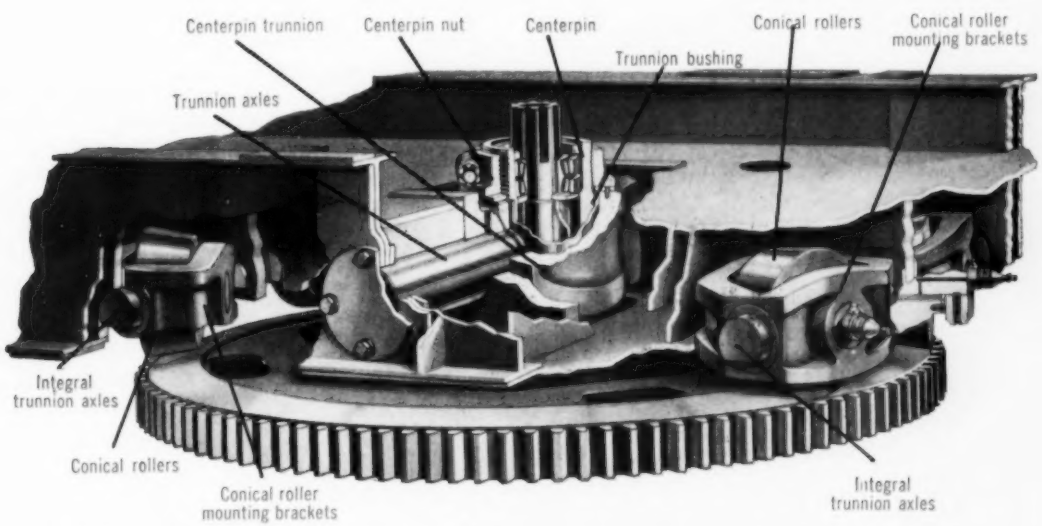
Always on top of the heavyweight jobs! Your operator in the cab of a Link-Belt Speeder King-size K-model *knows* he need *never* baby this machine!

He feels the smooth surge of greater *usable* hp through hefty, extra-size shafts, gears and clutches. He socks the dipper in—rugged K-model structural members soak up the shock.

And K-models deliver these output-boosting advantages: Speed-o-Matic, the *true* power hydraulic controls . . . fast, effortless power hydraulic steer . . . *plus* bonus usable hp.

If you'd like more facts demonstrating how King-size K-models (1½ to 3-yd. capacity) outstrip the field, see your distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.



Exclusive centerpin trunnion and oscillating roller design evenly distributes all loadings

The centerpin trunnion is mounted on two stub axles within the upper frame, permitting the upper to oscillate without any of the binding stresses common to other centerpin arrangements. All loadings are thus equalized with no prying action against the centerpin nut or bending stresses against centerpin and its bushing. Working hand in hand with centerpin design principle are the oscillating conical rollers. They are mounted within brackets that oscillate on stub axles, permitting full face contact of rollers with roller path at all times . . . no peening of roller edges or gouging of roller path. 15,231

LINK-BELT SPEEDER

It's time to compare . . . with Link-Belt Speeder

Glen Douglas— South Africa's Latest

By PETER HOLZ

AT a location about one hour's drive by car south of Johannesburg, the South African Iron and Steel Industrial Corporation Ltd. (ISCOR) has started another dolomite quarry (at Glen Douglas), with an adjacent crushing, screening, washing, and loading plant. Total quarry output is shipped by rail to the corporation's Vanderbijl Park works, 27 miles away. Formerly this plant, which has two blast furnaces, obtained its dolomite supply from another ISCOR quarry almost four times that distance away by rail.

At this time 2,000,000 tons of overburden have been removed at the Glen Douglas quarry by two Bucyrus-Erie Model 54 electrically-operated excavators with 2½-cu. yd. buckets. The overburden is loaded into 22-ton capacity Model C LeTourneau-Westinghouse rear-dumpers, and a 15-ton Euclid reardumper. All these units are also employed in carrying dolomite to the primary crushing plant.

In the quarry the ore is blasted with 60 percent ammon dynamite in 8-lb. cartridges, 3½ in. diameter and 22 in. long. These are supplied by Africa's largest explosives plant, African Explosives and Chemical Industries Ltd. This firm is also situated near Johannesburg, the industrial hub of the Union of South Africa.

Blasting holes are drilled by 2 Halco-Stenvick Mk. 4 "down the hole" deep rock drills, driven by compressed air. These units drill into the dolomite, which extends to a depth of 300 ft. in places, at the rate of 10 to 12 ft. per hour. Blast holes are 4 in. in diameter; and when they are loaded, they are blasted electrically. Cordtex detonating fuse is used. Detonators are of the millisecond-delay action type to minimize shock transmission through the rock strata.

The distance between the quarry and the plant is now only 0.7 miles, but this distance will gradually increase as quarrying progresses. The rear-dumpers drive up a ramp and drop run-of-mine dolomite into a receiving hopper lined with manganese steel.

From the hopper a 60-in. Link-Belt apron feeder (No. 1 in our flowsheet), takes the ore over a grizzly to a 30-in. Superior McCully Allis-Chalmers primary crusher, which re-

A general view of the complete plant, as it is now, with the primary crusher building in foreground. The rail-loading facilities can be seen in the left background.

Dolomite Quarry

duces the dolomite to a 6-in. product. Pieces larger than 30-in. are broken up at the quarry prior to conveyance to the crushing plant. This 80-ton Allis-Chalmers gyratory crusher has a capacity of 235 t.p.h. and is driven by a 175-hp. motor.

From the crusher a 30-in. Link-Belt apron feeder drops the 6-in. ore onto a system of Link-Belt conveyors using Dunlop standard cover belting. Some 4,630 ft. of belting ranging in width from 20 to 42 in. is used. All belts with 5-ply or over are supplied with standard Flexlok edges. The movement of dolomite through the plant is shown in the flowsheet.

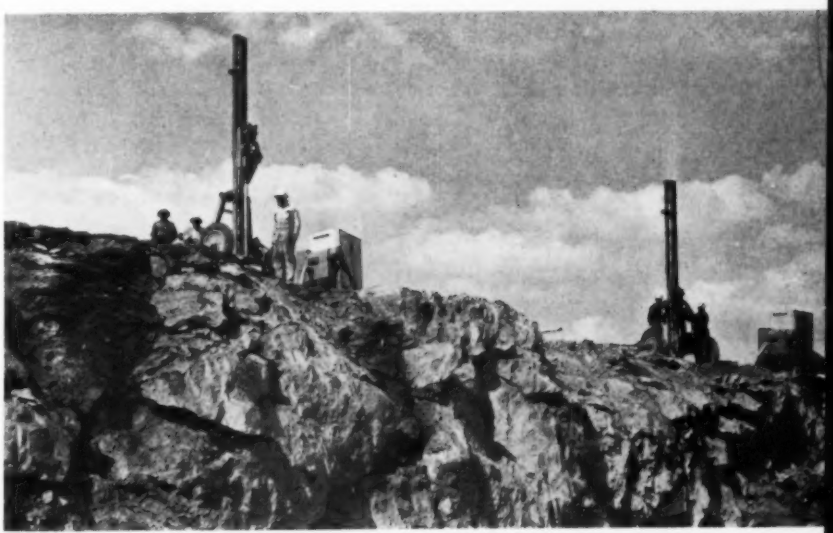
Although some of the equipment —the primary crusher, the 60-in. Link-Belt apron feeder, and the 10-in. Newhouse Allis-Chalmers secondary crusher driven by a 125-hp. motor)—has been taken over from a closed down ISCOR dolomite quarry, most of the equipment is new.

Of particular interest is the locally-built 6-ft. by 16-ft. Allis-Chalmers step-down screen. This unit has washing pockets and a capacity of 400 t.p.h.; it is installed in the secondary crushing, washing, and screening house. This double-deck screen, which has a manganese steel top deck and weighs 7½ tons, is the heaviest of its kind installed in this country.

Water in the plant is used at the rate of 1,000 g.p.m., most of it obtained from four boreholes on the property. Two slimes dams have been built up from quarry overburden, each with an area of 500 ft. by 500 ft. These two dams will suffice for the next seven or eight years, but

Pieces of dolomite larger than 30 in. are broken up in the quarry by secondary blasting.

Blasting holes in the quarry are drilled by two 4-in. "down the hole" deep rock air drills.

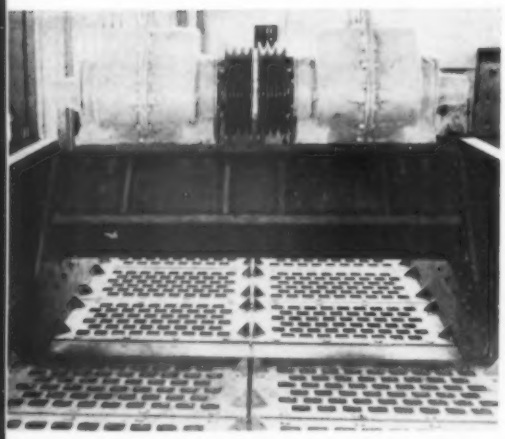


provision has been made for three more dams of similar size for future requirements.

Plant foundations include a 600-ft. concrete conveyor tunnel from beneath the 5,000-ton capacity live stockpile to the ore loading station. The gates below the stockpile and above the conveyor tunnel are of the air-operated sliding-gate type. The foundations of the primary crusher extend some 58 ft. below ground level, with an additional 10 ft. of piling, as bed formation was encountered while excavating. The roof of the conveyor tunnel has extra reinforcing under the stockpile, as well as at the point where the tunnel passes under a main road.

More than 70 railway trucks can enter the siding, which is straddled by the loading plant. (The South African Railways gauge is 3 ft. 6 in.)

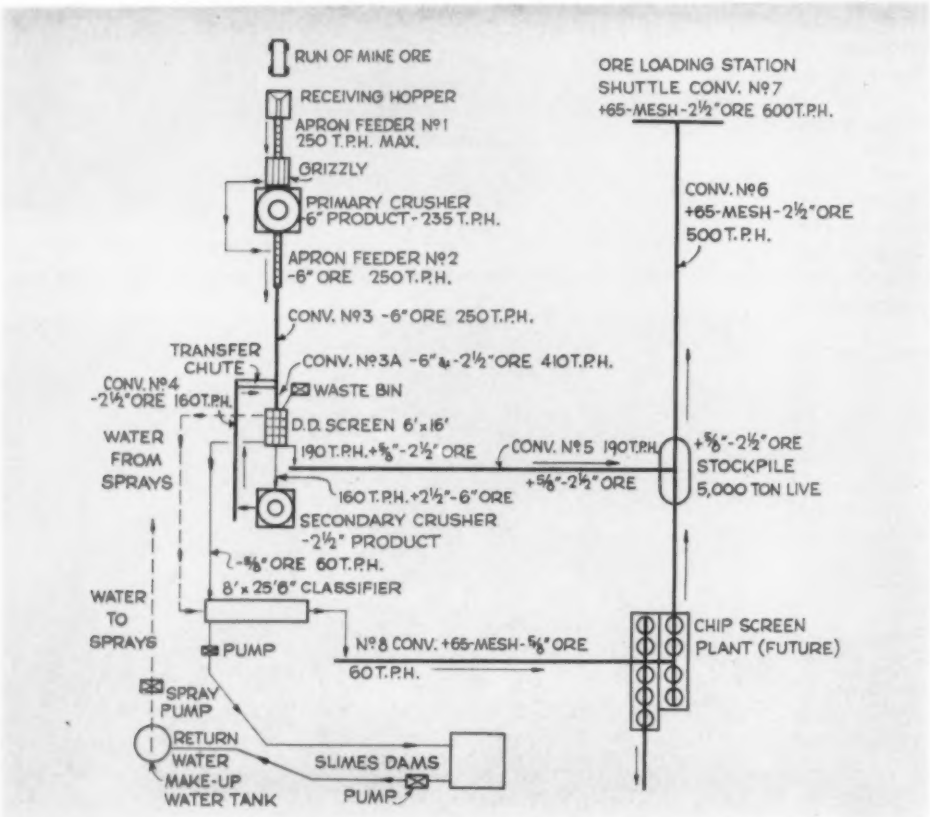
(*Continued on page* 132)

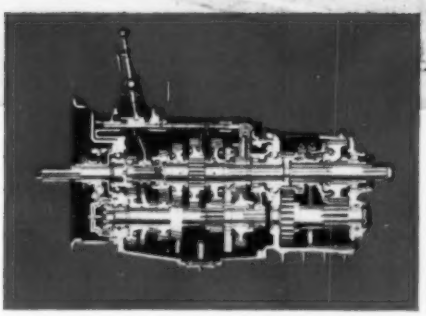


Left: The locally-built (under license) 6-ft. by 16-ft. stepdown screen.

Right: One of two 2½-cu. yd. electrically operated excavators loading overburden onto a 22-ton rear-dumper.

● **The flowsheet of the plant at Glen Douglas.**





Wells Overseas, Ltd., an associated company of Wells Cargo, Inc., Reno, Nevada, is using 16 KW-Dart 802-AT Tractors equipped with Fuller R-1160 ROADRANGER Transmissions in iron mining operations 250 miles south of Lima, Peru.

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...91-TON LOADS

with double bottoms...

Featuring 9-speed Fuller R-1160 ROADRANGER Transmissions, 16 KW-Dart 802-AT Tractors handle up to 91 tons of iron ore at a time on a mining operation in Peru.

Owned by Wells Overseas, Ltd., the 320 hp KW-Darts use the single-stick, semi-automatic ROADRANGERS to provide maximum performance on the cross-country haul from crusher to the seaport of San Juan. Because the diesel engines can operate in the peak torque and hp range at all times, the 72-mile round trip is made in 3½ hours, including time for loading and unloading.

Ask about the Fuller Transmission designed to boost *your* profits.

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Glen Douglas

(Continued from page 130)

Each truck is filled, then weighed by a Carl Schenck weigh-bridge of German manufacture. The loading station can handle up to 600 tons of dolomite per hour if necessary. The weigh-bridge has a platform 46 ft. long and has maximum weighing capacity of 240,000 lb. It is fitted with a patent Carl Schenck Securitas steelyard incorporating a "correct weight only" feature. The weight of each truck is recorded on a ticket; in addition, the weights may be read off a Schenck optical reading scale.

At the time this picture was made of the loading plant, the railway line had not yet been connected with the weighbridge.

More than 200 tons of steel have gone into the Glen Douglas plant, all of it made locally by ISCOR. Excavations and concrete work commenced in January, 1959, and mechanical erection of the plant commenced in October, 1959. About 20 Europeans and 100 Africans are employed at this plant, which is the third of similarly laid out ISCOR dolomite quarries in this country.

Robert Purdy Elected President Of Ohio Sand and Gravel Assn.

THE annual meeting of the Ohio Sand and Gravel Association held at Columbus, November 4-5, 1959, was considered one of the most interesting ever held. President William E. Hole, American Aggregates Corporation, Greenville, presided at all sessions.

During the meeting the association's officers for 1960 were elected, as follows: president, Robert Purdy (Killbuck Sand & Gravel Company); vice-president, Pat Milligan (Sidney Sand & Gravel Company); treasurer, Neil Rouse (Jackson Pike Sand & Gravel Company); and secretary, Claude L. Clark, Columbus.

One of the best received talks of the Wednesday session was presented by E. K. Davison (J. K. Davison and Brother), Pittsburgh, Pa., chairman of the National Sand and Gravel Association Committee on Public Relations. This speaker clearly indicated the importance of each industry member carrying on some specialized public relations effort.

He stated that a public relations program for the sand and gravel industry is fundamentally what the management is willing to do to alleviate those conditions which the public finds objectionable.

The Thursday sessions were concerned primarily with specifications, production, and the use of various sizes and grading of aggregates. The session was started off by Pat Milligan, chairman.

Mr. Milligan reported on the efforts of the association to have the Ohio State Highway Department modify its 100 percent crushed aggregate specification for aggregate used in bridge superstructures. The presentation made to the highway department was that concrete produced with normal plant-run gravel is of a quality equal to that produced with 100 percent crushed gravel from the same deposit.

Mr. Milligan reported that the association's recommendations were not entirely acceptable to the highway department specification committee, but that this body is considering a change of specifications which would modify the crushing requirements to 40 percent.

F. W. Kimble, flexible pavements engineer, Ohio Department of Highways, discussed the future use of Supplemental Specification B-219 waterproof aggregate base course which can be applied over crushed aggregate or any of the macadam type base courses with the same equipment and skills used to place all other pavement courses.

He described the B-219 base course as a proportioned coarse aggregate in which there is interspersed a bituminous mortar which fills almost all void spaces. The coarse aggregate phase is so proportioned that it affords a stable course having good load-bearing qualities.

Fred Hubbard, consulting engineer for the Standard Slag Company, discussed the effect of the size of coarse aggregate on the quality of portland cement concrete. The present practice in Ohio, Mr. Hubbard said, is to use about 60 percent #3 (1½-in.) and 40 percent #4 (¾-in.) aggregate for paving concrete.

In most gravel operations in the state these sizes are not present in natural deposits in this percentage, a situation making it difficult to serve large paving jobs without first building large stockpiles of the #3 size. He described tests of concrete samples made with #4 aggregate, compared with the ratio described above.

It seems logical to conclude from the tests, Mr. Hubbard said, that satisfactory concrete for paving can be made with aggregate having a maximum size of ¾ in.

Kenneth Tobin, N.S.G.A. associate executive secretary, gave a comprehensive report on national affairs affecting the industry.

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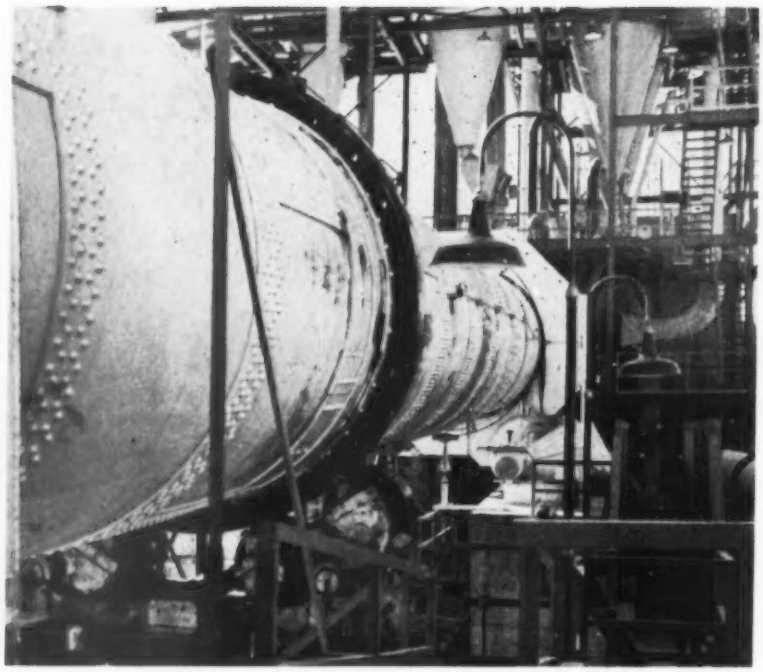
Whether it's sand, mud or the rockiest grade . . . the General Tire keeps rolling to keep projects on schedule. With exclusive Nygen-cord construction, the General Tire defies the worst job hazards while its heavy, husky tread provides traction beyond comparison. You get maximum flotation, minimum rolling resistance, too! That's why the tough-built General Tire keeps going whatever the going! See for yourself on your next job!

THE GENERAL TIRE & RUBBER CO. Akron, O.

Hard-Facing Prolongs Life Of Kiln Tires, Trunnions



The 9- by 120-ft. kiln in the Lovelock plant of the Eagle-Picher Company, showing the tires and trunnions.

ROTARY kilns are extremely heavy pieces of machinery, and the weight of the loaded kilns as they revolve is borne by the trunnions which support the riding rings, or tires.

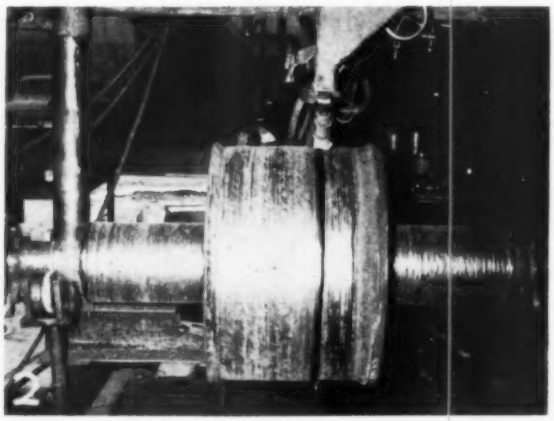
Some maintenance engineers theorize that the trunnions should be somewhat softer than the tires, in order to absorb wear. But experience at the diatomaceous-earth operations of the Eagle-Picher Company in Nevada proved the reverse to be true. The softer trunnions quickly became severely abraded and induced considerable wear on the tires. Rebuilt by hard-facing, however, the faces of the trunnions maintained smooth, polished running surfaces, and the service life of both the trunnions and the tires was greatly extended.

The practice was initiated some years ago at the company's plant at Clark Station, near Reno, and has now been adopted at the new plant near Lovelock, Nev.

The Lovelock plant kiln, a 9- by 120-ft. oil-fired unit, calcines a part

Fig. 1—The worn trunnion, after being removed from service. Note the rough surface, which transferred wear to the kiln tires.

Fig. 2—The trunnion being rebuilt with the automatic welder. Normal submerged arc procedures were used.



of the diatomaceous-earth product, and went into service when the new plant was completed in the fall of 1958. The trunnions at the Lovelock kiln are 24 in. in diameter, with a 16½-in. face. As shown in Fig. 1, wear on the face had extended as much as 1 in. deep. The Sierra Engineering Company of Reno, which had previously rebuilt the trunnions on the Eagle-Picher plant at Clark Station, was again called in on this job.

Sierra used automatic welding techniques. About seven passes of Stoody 104, a 3.2 percent alloy composed of manganese, molybdenum, silica, and carbon in an iron base, were required to bring each trunnion to the necessary machinable dimension. This alloy is moderately abrasion-resistant, and also highly impact-resistant. The 104 wire was applied at about 500 amps., 30-32 volts, using straight polarity.

The trunnions were rebuilt to 24⅛-in. diameter and then finish-machined with a Carboloy 883 tool to the desired diameter of 24 in. Shafts were also rebuilt with Stoody 104 wire to a size of 7 15/16 in. and then machined to a final diameter of 7¾ in.

Subsequently the cylinder was taken directly from the welding positioner to a lathe, to be rough-machined while still hot—about 800 deg. F. To assure proper dimensions, finish machining was done after the trunnion had cooled. Welding time required for each trunnion was 12 hours, rough and finish machining requiring the same amount of time.

The cost of rebuilding and machining each trunnion was only about 30 percent that of a new part. Added savings, too, will be realized from the extended service life and reduced maintenance of the kiln tires, according to the management.

The Lovelock plant produces both natural and calcined earths for filter-aid purposes. Raw material comes from a new and extensive deposit about 15 miles northwest of Lovelock. The older plant at Clark Station confines its output to a line of products marketed under the trade-name "Celatom." These are sold largely to the paper trade, polish manufacturers, the ammonium-nitrate industry, and calcium-silicate insulation makers.

Ideal Cement Operations Honored for Safety Records

Employees of the Gold Hill, Oreg., plant and the Marble Mountain quarry of Ideal Cement Company were recently honored at a Boettcher Safety Award picnic for an outstanding safety record. The Boettcher Safety award is named in memory of the founder of Ideal Cement Company.

The Gold Hill employees had achieved the longest consecutive period without a lost-time accident among the firm's 16 plants in the United States—no lost-time accidents during the years 1957 and 1958, and 1,171 consecutive days of operation in 1959 at the time of the award.

The Marble Mountain employees celebrated the operation's fifth consecutive year without a lost-time accident.

Community-Minded Producer Sponsors Scholastic Awards

A fine example of a firm oriented with a sense of community responsibility is the Interstate Sand and Gravel Company of Covington, Ind., which sponsors jointly with the Fountain Trust Company of Covington a scholastic achievement award project.

In contrast to the usual custom of recognizing gridiron and other sports proficiency, letter jackets or blazers are awarded to honor roll students at Covington High School for outstanding academic work.

The school principal reports that the idea has met with enthusiastic response, and the students are trying to top last year's record, when 17 students were commended for their prowess with books, not brawn.

GALEN THOMAS has been appointed sales manager of the new Southwest Division for Kaiser Gypsum Company in New Mexico. Division sales offices have been established in Albuquerque. Work is being rushed on construction of the new plant at Rosario.

Fig. 3—Finish-machining provides an ideal surface for smooth metal-to-metal contact.

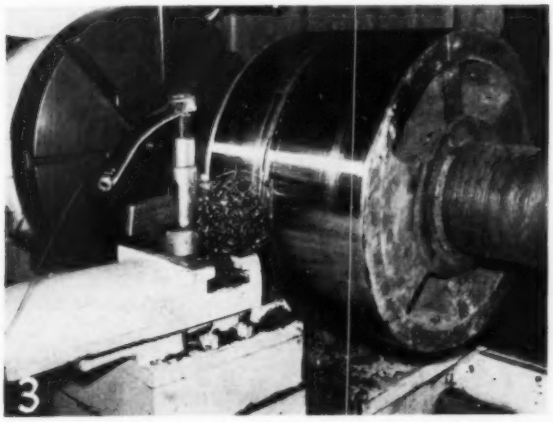
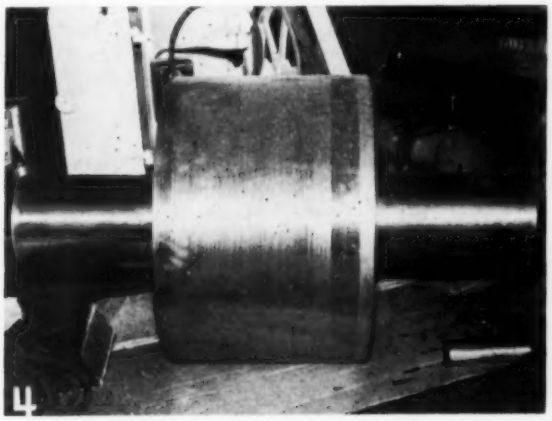


Fig. 4—After the face and shafts were finish-machined, the rebuilt trunnion was ready to be placed in service again.



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New Chevrolet tandems do bigger day's work!

With a tough new build that includes revolutionary Torsion-Spring Ride and the strongest rear suspension yet, Chevrolet's new tandems are equipped to do more profit-producing work per day than ever before. They're built to move mountainous payloads faster and more efficiently over rough routes, on or off the road.

Chevrolet's new M70 tandems – available on 157-, 175- and 193-inch wheelbases – are built to work more and earn more on big-tonnage runs, with extra load capacity and sensational new Torsion-Spring Ride. It's a ride that takes the rough edges off the biggest of bumps, easing the strain on driver, cargo and chassis components alike. You get a new kind of smooth-going *roadability* that pays off out on the job by assuring more ton miles of operation per day . . . higher safe speeds for extra trips and bigger profits.

Underlying this new roadability is Chevrolet's tough new torsion-spring independent front suspension system – available in high 7,000-lb. and 9,000-lb.* capacities. Here, rugged cast and forged steel control arms guide each front wheel precisely, and heavy-duty spherical joints and massive pivot bearings keep friction low. And for maximum off-the-road handling ease power steering is standard in all tandem models.

New Eaton-Hendrickson Rear Suspension

Back under the load is a totally new tandem rear suspension featuring two big 16,000-lb. axles, with rugged walking beams and torque arms to keep them tracking true. New, direct single-line drive – simple yet rugged in design – features a new inter-axle differential that divides the driving load equally at all times for less wear and long, trouble-free life. And you get the best kind of big-truck *power*, too, with Chevy's famous 230-h.p. Workmaster V8 provided as standard equipment. Your Chevrolet dealer can fill you in on all the facts. . . . Chevrolet Division of General Motors, Detroit 2, Mich. **Optional at extra cost.*

1960 CHEVROLET STURDI-BILT TRUCKS CHEVROLET

material specifications, market needs lead to

New Operation, Doubled Production, Increased Fine Crushing

ANOTHER ON THE SPOT report

MORE fine crushing capacity — this is an increasingly important requirement which most operators throughout the industry have already been forced to do something about, or soon will be, in order to maintain a favorable market position.

Eshleman Quarries, of Landisville, Pa., is a rather typical case in point. Like most average-size or small firms in the industry, this crushed stone producer is primarily concerned with local markets and conditions. However, increasingly stringent specifications on smaller-size aggregates finally entered this local picture, to affect production of material destined for township road work, as well as ready mixed concrete aggregates.

The result—Eshleman Quarries built a completely new plant to replace an older operation, and in doing so, not only doubled overall capacity to about 300 t.p.h. maximum, but provided four crushing units to attain sufficient capacity in production of the finer sizes.

Placed in operation in mid-1958, the present plant was designed by James Eshleman, general superintendent, and his father, J. Eshleman, who founded the company nearly 30 years ago. The elder Eshleman had been a road building contractor, an activity with which the present organization is still closely allied. It not only supplies such work with aggregates and ready mixed concrete, but still maintains a paving crew to handle various township projects.

By BUREN C. HEROD

An accompanying photo illustrates the simplicity and compactness of the design. With the exception of the closed-circuit tertiary crushing phase and its return belt, a single pass flow is maintained from primary reduction to loading bins. Both the plant, and the quarry from which it is supplied, represent new developments for the company. They are located on a tract physically separate from the former operations, where the depleted original quarry was abandoned, and the old plant was completely dismantled.

In the approximately 50-acre tract, test drilling disclosed more than a 100-ft. depth of dense limestone which has amply met all tests for concrete aggregate and road material. Considerable folding, and consequent jointing and fracturing, of the beds, as well as some dirt pockets, are evident.

Stripping of overburden is handled periodically ahead of face advance with a bulldozer and a backhoe. On this cleared surface blast holes are sunk with a Chicago Pneumatic drill fitted with 3-in. Timken bits. These are drilled to a depth of 40-45 ft., and on a pattern that is varied in accordance with the condition of the formation in the area being drilled.

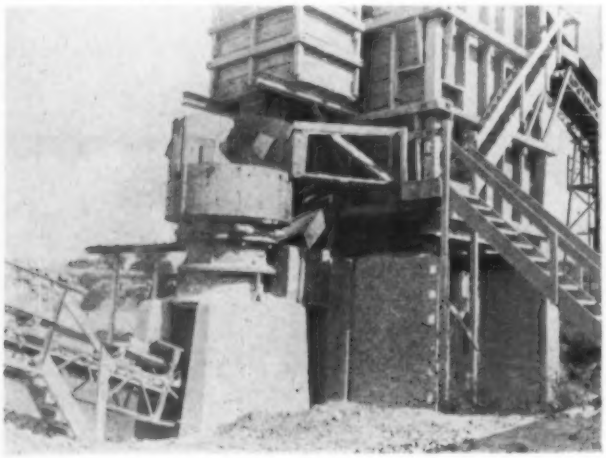
Generally, 12 to 14 primary blast holes are sunk for one shot, as well as some toe holes. These are charged with standard dynamite, and result in yields ranging between 2.5 and 3 tons of stone per pound of explosive

Good-quality, dense stone is available to a depth of over 100 ft. in the present Eshleman quarry. Drilling and blasting provides a face between 40 and 45 ft. high.

The primary crushing installation incorporates a 42-in. apron feeder, and a 30x42 jaw crusher. The conveyor (right) connects with the scalping screen tower.

When dirt pockets in the quarry contaminate the plant feed, the dirty material is removed from the flow through the bottom deck of the scalper in the structure at the center and dropped into the bin below for ballast material.

This secondary crusher is fed stone retained on the top deck of the scalper via the chute (top center). At the right is the drive-through for truck-loading of ballast.



consumed. Any secondary breakage required is done by dropballing.

For the current short haul to the crushing plant, quarry-run stone is loaded out with a 1-cu. yd. Koehring shovel; and 10-ton end-dump Euclid trucks are used for haulage.

At the plant site, the latter dump into the hopper of a 42-in. feeder supplying the primary crusher. The latter two units, and the bulk of the processing components are Telsmith equipment; they include a scalping screen, a secondary cone crusher, a tertiary cone crusher, and a finishing screen. Conveyors, belting, and the primary screen are Hewitt-Robins units.

In the 30x42 primary jaw crusher, which is driven by a 125-hp. motor, primary reduction is accomplished through a 6-in. setting. Crusher discharge is received on conveyor No. 1, 30-in. by 160-ft., and is transported to the scalping tower.

The latter is comprised of an enclosed 4- by 12-ft. double-deck scalper mounted above a truck-loading bin. A split between plus and minus 3½-in. is made on the top deck of the scalper, the retained material being chuted to the secondary crusher. The bottom deck of the scalper is divided into ⅝- and 1½-in. opening sections. With this setup, the dirty material sometimes entering the process (due to the dirt pockets in the formation noted earlier), may be pulled off at the scalping stage and discharged into the underlying truck bin for use as ballast. If the stone in process is clean, the scalper throughs may pass *via* flop gate to join the bottom deck retained fraction delivered to conveyor No. 2.

Secondary reduction of plus 3½-in. stone from the scalper is done with a 13B Telsmith cone crusher. Driven by a 60-hp. Westinghouse motor, this crusher reduces the stone to the maximum of 2½-in. These products are chuted to conveyor No. 2, where they join the other fractions produced in scalping.

The latter belt, 24-in. by 150-ft., transports the material in flow to the

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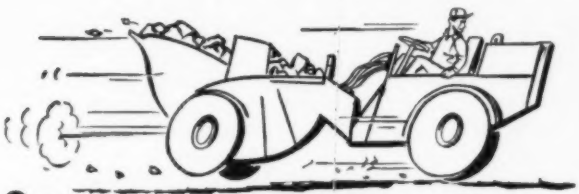

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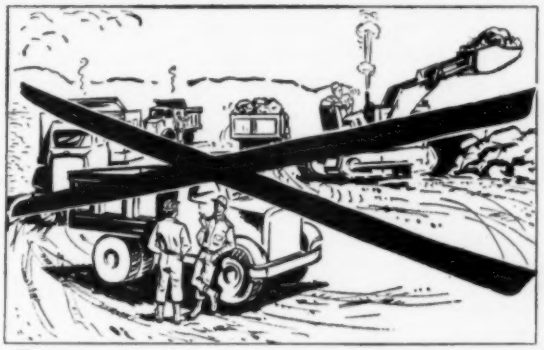
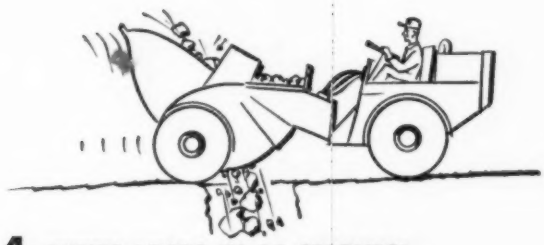


3. NEVER WAITS ON OTHER EQUIPMENT! S-D Transloader saves labor and machine costs wasted in multiple machine operation.



4. DUMPS LOADS IN 15 SECONDS!

5. NO TURNAROUNDS REQUIRED! Returns immediately to reload! Travels at higher speeds than other equipment because of low center of gravity and articulated steering!

THIS IS WHY the S-D Transloader is more efficient than conventional equipment and methods of materials handling. But this is not all. The S-D Transloader way is the **lowest possible cost way** because:

1. **LOWEST ORIGINAL COST** for tons handled!
2. **LOWEST MAINTENANCE** due to extremely simple design and high quality of components . . . such as T-1 Steel, Cummings Engines, Clark Axles, Allison Transmissions!
3. **LEAST VENTILATION** required underground due to low horsepower ratio to work-done!
4. **LOWEST LABOR COST PER TON!** Incentive systems fit the S-D Transloader like a glove because of solo operation! Nothing could be neater than an operator loading and running a known distance to discharge **by himself!** This RELEASES SUPERVISION! S-D Transloader also ELIMINATES TASK OF TRYING TO BALANCE MEN AND EQUIPMENT WITH CONSTANTLY CHANGING SITUATIONS!

Write us today for Complete Packet of illustrated literature, data and time studies on this remarkable machine —

THE ONLY SELF-LOADING TRANSPORT! Sanford-Day Iron Works, Inc., Dale Avenue, Knoxville, Tennessee. Telephone: 3-4191

SANFORD-DAY

KNOXVILLE, TENNESSEE

Fine tertiary reduction is accomplished in the crusher at the left, and relatively coarser crushing (to a top size of 1½-in.) is done with the fourth crusher (right).

primary screen of the finishing phase. On this 4- by 14-ft. triple-deck unit, separation is made with screencloth of 2½-in. openings on the top deck, ¾-in. on the middle, and ½-in. on the bottom.

Plus 2½-in. material retained on the top deck is chuted to one of the two tertiary crushers—a jaw driven by a 75-hp. Reliance motor, and set for reduction to 1½-in. maximum. The retained fraction from the middle deck of the primary screen is chuted to the other tertiary crusher—a Telsmith Gyrasphere. This unit reduces through a ¾-in. setting for the finer tertiary crushing, and is driven by a 75-hp. G-E motor.

The lower deck retained fraction is dropped into a 30-ton bin, and the passing fraction may drop into an adjoining bin of the same capacity, or pass to 18-in. by 30-ft. conveyor No. 4 for transfer to the final screen.

Products of tertiary reduction are received on conveyor No. 3—24-in. by 75-ft.—and are returned to the primary screen feed belt (No. 2) in closing this crushing circuit.

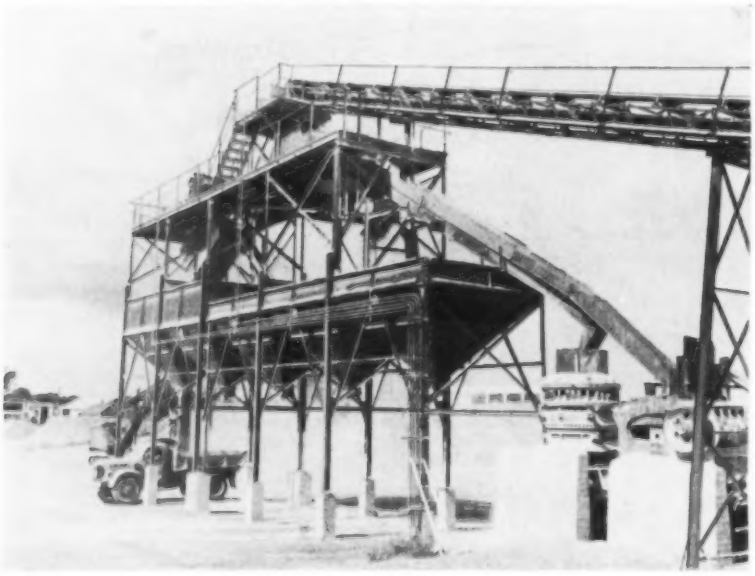
The finishing screen, which is mounted in tandem with the preceding primary screen above a set of loading bins, is a 3- by 8-ft. double-deck unit. Separation of finished products is made with ¼-in. opening screencloth on the top deck, and 8-mesh cloth on the bottom. The three fractions resulting from this split are chuted to a pair of 60-ton bins and one 30-ton compartment.

In addition to direct truck loading from the above screen bins, rehandling of stockpiled materials for truck loading is done with an Allis-Chalmers Tractoloader. A fleet of seven dump trucks is used for haulage to the firm's own paving jobs and for delivery to customers. Most of the company's market falls within a 10-mile radius of Landisville, and the bulk of the aggregates is destined for township road work.

An important companion operation to the crushed stone facility is the ready mixed concrete batch plant operated by The Eshlemans. This Blaw-Knox installation incorporates a 3-cu. yd. mixer, and serves a fleet of 10 mixer trucks. All aggregates required, except sand, are supplied from the nearby crushing plant. The expansion recently undertaken also involved the construction of a new 10-bay garage and maintenance shop for the truck-mixer fleet.

The problems on aggregate sizes and plant capacities faced by the Eshleman organization have been efficiently solved, as they have been by many other comparable operations in the industry. This firm's expanded and improved quarry and plant operations still require only an overall crew of 5 men under James Eshleman.

The primary screen (top center) separates two fractions from the flow for delivery to the two tertiary crushers (lower right). At the left is the final screen.



DONALD LAWSON has been named assistant plant manager of Lehigh Portland Cement Company's plant at Alsen, N. Y. He was previously plant engineer there.

Enter 141 on card, page 169 →

Can your loader "lift its lip" and duplicate dozer action? No?

Then trade it off without delay! Because you'll miss money-making opportunities right and left without this big-capacity 4-in-1 action. And you have positive "radius control" of dozing depth; plus strength for hard digging! Here, the new International Drott TD-20 4-in-1 is dozing heavy gumbo material like a full-size blade!

Can your loader grade and strip like a carry-type scraper? No?

Then consider what extra service—and extra-valuable service you would have—with versatile scraper-like action at your fingertips with a moderately-priced 4-in-1! This TD-20 4-in-1 is stripping sticky clay. It can also grade or spread materials with similar accuracy.

ONLY A CLAM-ACTION 4-IN-1

can replace up to $100,000 of limited-duty equipment!

Can your loader "bottom-dump" and handle sticky materials? No?

Then retire the "relic" and go modern! You can't choose the materials you excavate. You can't prevent adverse weather that makes materials sticky! But 4-in-1 bottom-dumping eliminates the sticky materials problem and gives you a vital dumping height plus advantage over ordinary roll-forward buckets.

Move the selector lever—prove to yourself only the clam-action 4-in-1 doubles for a whole spread of "big-ticket" rigs—gives instant changeovers. Compare 4-in-1 capacity and versatility to any single-action loader. Measure exclusive shock-swallowing Hydro-Spring advantages. See your International Drott Distributor for a demonstration—prove you can save up to $100,000 on equipment!

Does your loader have measured, advertised breakout action? No?

It's the genuine and exclusive pry-over-shoe breakout action that enables International Drott 4-in-1's to replace far costlier boom-type rigs on jobs like breaking up and loading out hard, heavy stratified or embedded materials. The NEW TD-15 4-in-1 exerts the enormous force of 39,200 lbs!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

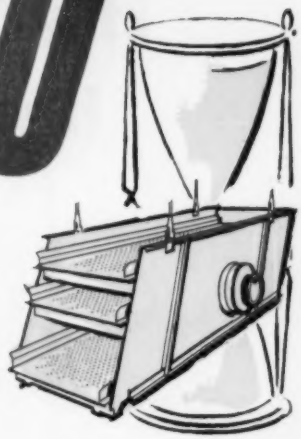
INTERNATIONAL® DROTT

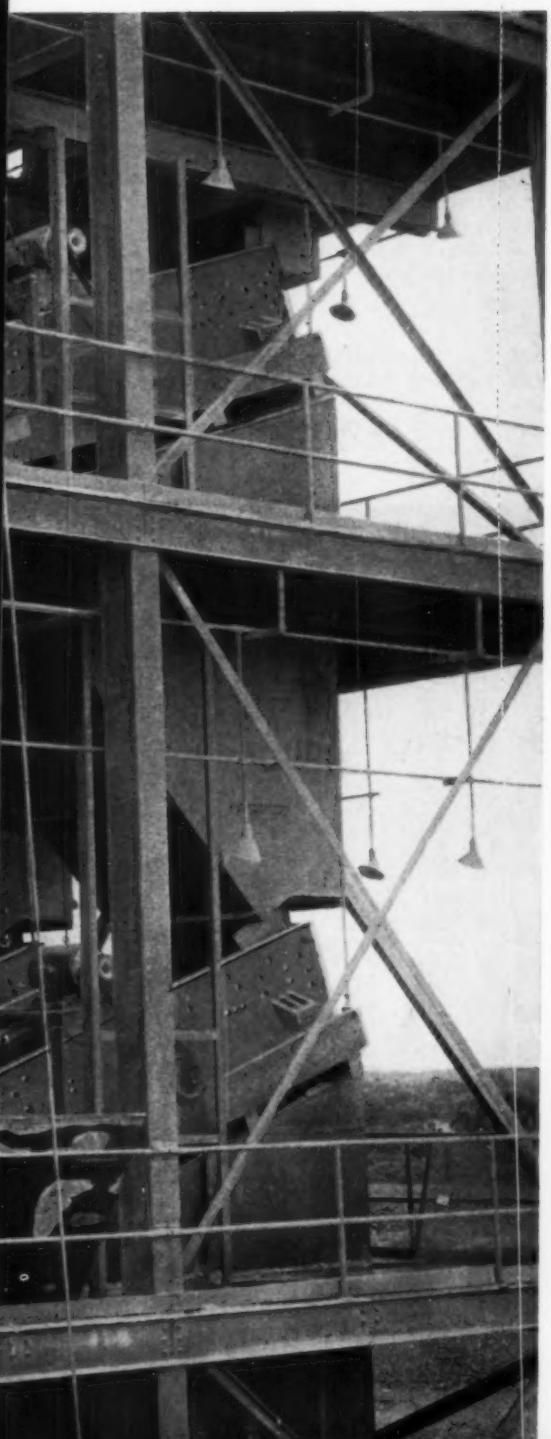
make time work

WITH TIME-CONSCIOUS

FOR you in '60

SECO SCREENS





Time is the one intangible factor that can make any operation a success or a failure. Lost or excessive man and equipment hours can easily turn a potentially profitable job into a loss or one with marginal profit. And competition will be keener in the 60's . . . so it stands to reason the operator backed up with production efficiency will count BIG PROFITS going into '61 . . . the operator with time-wasting equipment on the job will lose. Make sure you're "set for '60" with SECO "TIME-CONSCIOUS" VIBRATING SCREENS on your job to assure day-in and day-out dependable performance all year long. What's more you'll be assured of the consistently *accurate* sizing that today's buyers demand. Remember . . . with SECO SCREENS, the stamina is built right in before the nameplate goes on. Put time on *your* side for the 60's . . . with SECO "TIME-CONSCIOUS" VIBRATING SCREENS.

SECO BUILDS OVER 450 MODELS IN 4-BEARING AND TWIN BEARING TYPES. SEND FOR FREE SECO LITERATURE (4-Bearing Catalog #204 and TWIN BEARING Booklet TB-21)

SCREEN EQUIPMENT COMPANY, INC.
BUFFALO 25, NEW YORK

SECO

VIBRATING SCREENS

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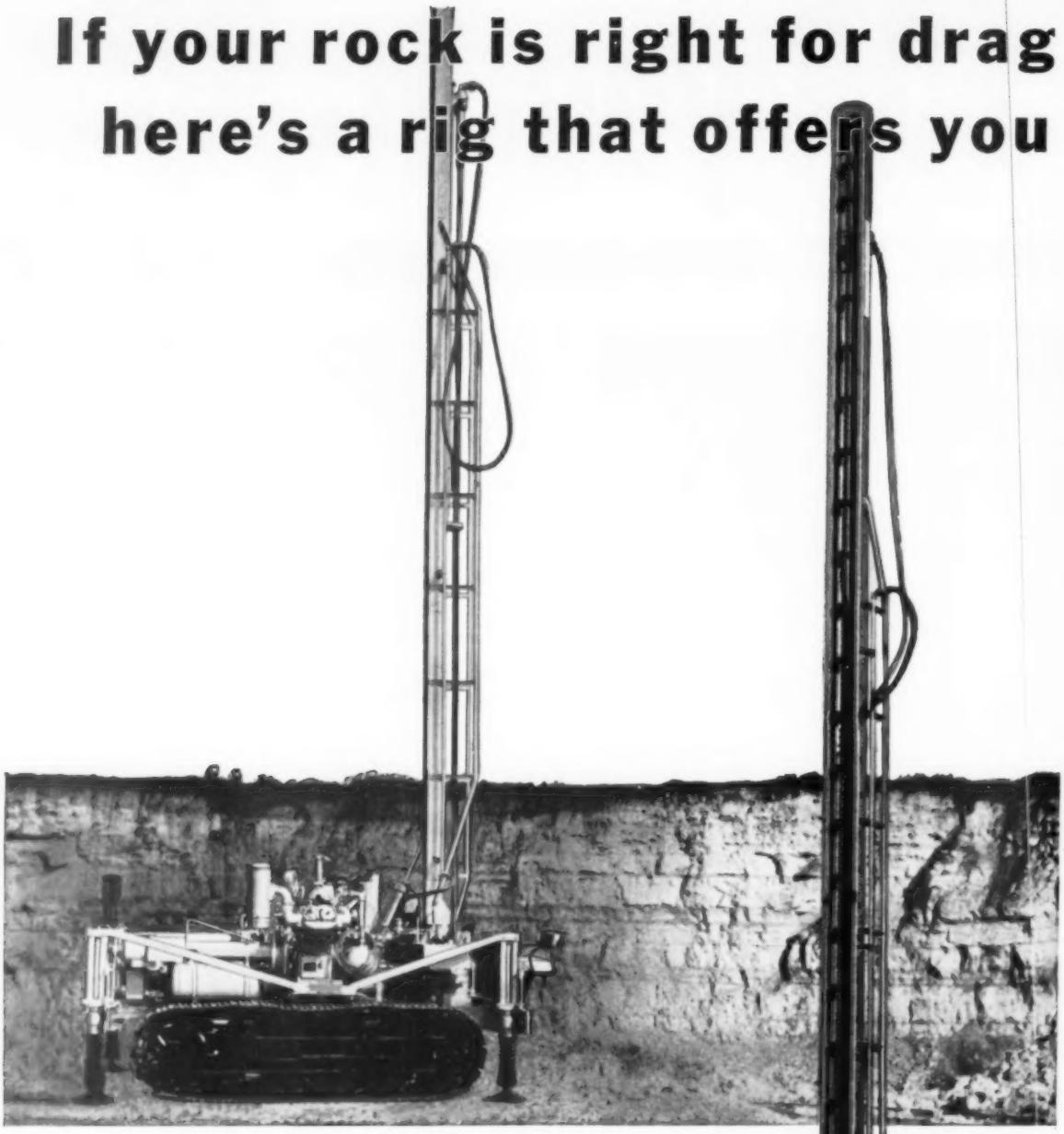
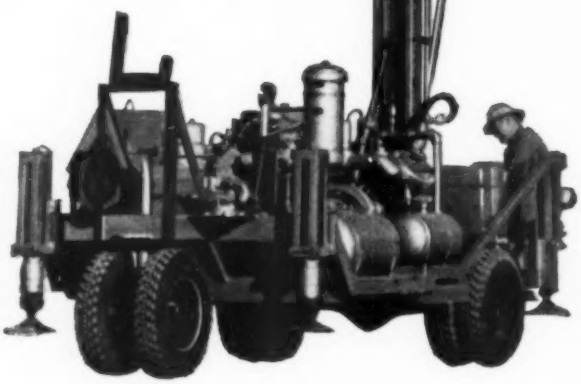
If your rock is right for drag here's a rig that offers you





New Gardner-Denver Zephyr—available on wheel or crawler mounting to meet drilling requirements.

bit operations
new drilling economy

NEW GARDNER-DENVER ZEPHYR ROTARY BLAST-HOLE DRILL

Self-Propelled . . . Completely Self-Contained . . . Designed for Fast, Efficient, One-Man Operation

10,000-lb. pulldown—hydraulic pulldown conservatively rated at 10,000-lb. bit pressure. For drilling fast, straight hole in tricky formations, pulldown is regulated by dual hydraulic controls that vary either volume or pressure. Pulldown circuit can be operated continuously at peak loads.

Instantaneous travel control—no lost time in coming out of the hole. While on pulldown or while hoisting, feed rates are changed instantly by use of hydraulic controls. Bit up-travel speeds of 100′ per minute.

Centralized controls—all controls for drilling and drive grouped at rear of drill for ease of operation.

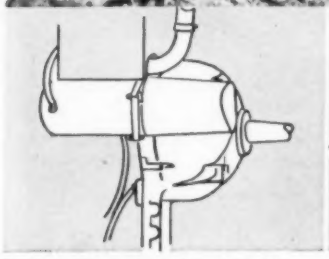
Heavy-duty rotary table—four speed options varying from 20 to 450 rpm. Rotary sleeve supported by heavy-duty, tapered bearings rated at 25,000-lb. thrust load. Heat-treated spiral bevel gear and pinion run in oil.

Hole sizes—from 1¾″ to 4¼″ diameters. Kellys available from 1¼″ hexagon to 3″ round.

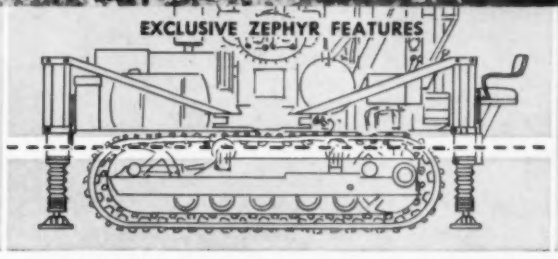
Air package—Gardner-Denver ACL air-cooled, single-stage compressor rated at 200 cfm displacement. Clutch provided so other components may be operated independently of compressor.

Contact your Gardner-Denver representative for full details.

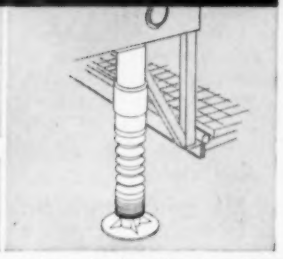
EXCLUSIVE ZEPHYR FEATURES



Torque converter for smoother operation on the road and while drilling.



Track stability—low center of gravity on either model assures maximum safety and stability.



Four hydraulic leveling jacks for faster setups and greater stability.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

CEDARAPIDS Portable-Stationary Combination MEETS INTERSTATE 80 SPECIFICATIONS

Portable plant setup helps Schildberg Construction complete a million ton crushing contract two months ahead of schedule!

When work started on Iowa's Interstate 80 west of Des Moines, Schildberg Construction Company of Greenfield, Iowa, had the contract to supply 1,145,328 tons of specification aggregate to the four prime contractors on the job. The job was scheduled for completion in 7½ months.

A big order! But Schildberg solved it in 5½ months with one of the Midwest's most productive spreads of Cedarapids Portable Plants combined with a stationary Double Impeller Impact Breaker, which poured out material at a 1,000 ton-per-hour clip. The contract called for 622,517 tons of rolled stone base and 522,811 tons of granular subbase.

To meet contractor schedules for laying around 14,000 tons of aggregate on the road per day, enormous stockpiles had to be built up. Specifications called for crushing 90% of the quarried limestone to 1" minus, and to add 8% to 10% moisture to obtain optimum moisture content. Cold weather and heavy snow prevented going into full production until the middle of May. By September 15 the contract was completed, "and we had some overrun to boot," commented Mr. Schildberg.

In addition, this plant supplied another 100,000 tons of aggregate to another contractor for work on state highway 25. With other Cedarapids portable plants in three quarries helping to boost total output for the year to well over 2 million tons of aggregate and aglime, not one of Schildberg's regular customer deliveries was delayed. Not once did any of the Interstate contractors have to wait for material.

Mr. Schildberg's philosophy is "Production and quality are the key to success." That's why he depends on the quality engineering and high production of Cedarapids equipment to handle every job, from Interstate work to drive-in aglime trade, profitably.

Ask your Cedarapids Dealer to show you how to get lowest cost per ton with Cedarapids engineered stationary plants, portable plants, or a combination of both. Call him today.

IOWA MANUFACTURING CO.

Cedar Rapids, Iowa

5360-N

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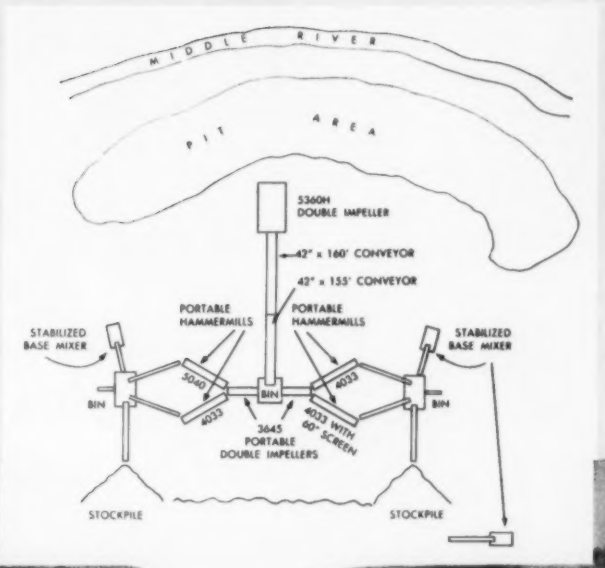
averages 10,000 TONS of aggregate per day

"T" arrangement of crushing equipment prevents bottlenecks

Schildberg's efficient "T" layout eliminated truck traffic jams and assured the most efficient flow of material through the plant. A Cedarapids stationary 5360H Double Impeller Impact Breaker at the base of the T stem served as the primary crusher feeding two Portable 3645 Double Impellers from a 100-ton surge bin. From this point, the material flowed out both arms of the T through two Portable Hammermill Crushing and Screening Plants on each side for final reduction and grading. Aggregate was then conveyed to 50-yd. bins at each end of the T arms, where it was fed either to Cedarapids Stabilized Base Mixers for obtaining proper moisture content, or diverted to trucks for stockpiling. A third Stabilized Base Mixer was located at the end of the stockpile.



Here's proof Coromant rope-thread bits and steels SAVE TIME AND MONEY

"Up to double the footage between sharpenings!"
"Premature rod breakage is almost non-existent!"
"40% more usable life—more resharpenings!"
"Bit and rod life are well above average!"
"Uncouple by hand all the time!"
"More rigid—drills straighter holes!"*

**Names of men quoted available on request*

The comments above are actual quotes from project managers, job superintendents, and drill superintendents who have tested new Coromant rope-thread bits and steels. They've learned, on-the-job, the benefits they—and you—can expect!

For example: The new rope-thread (only two turns per inch) holds tight in use, yet permits hand uncoupling. Reports show that the time saved results in more footage drilled per shift. Bit footage is well above average too, with less loss of carbide inserts. Prime quality ore plus nickel-chrome alloy permits cold-rolling from billets for greater strength, life and rigidity. And only with Coromant rope-thread steels can you re-thread without heat treating, too. Do it yourself, or at any nearby machine shop.

Want to know more? There's no obligation on your part, but we'll be glad to help where we can. Just call your nearest Atlas Copco Office, or write to us at Dept. PQ-7.

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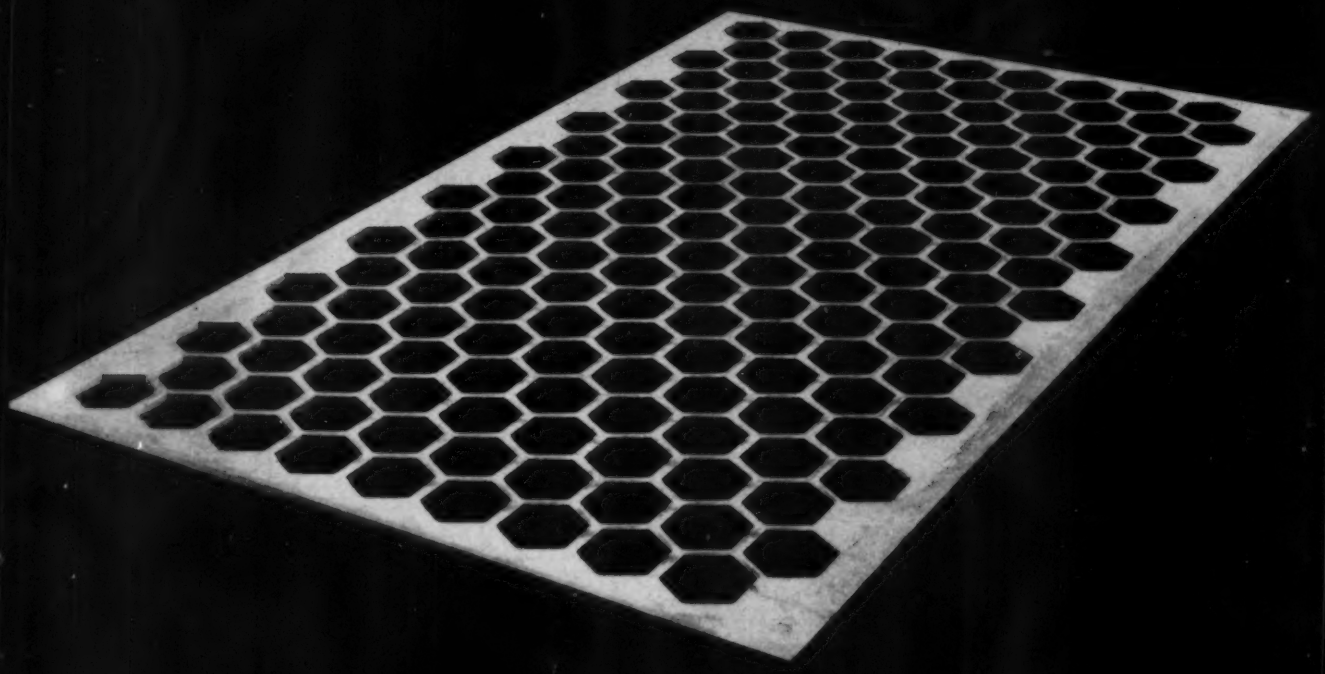


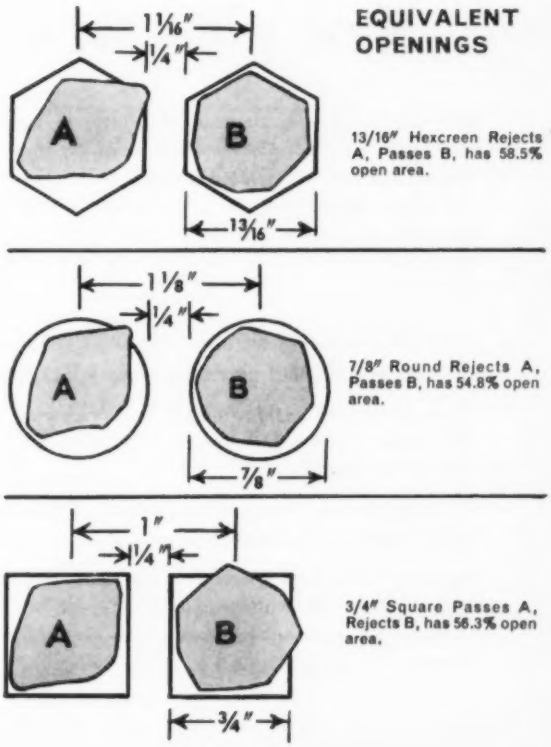
For rock products screening . . .

Cross HEXCREEN* gives more uniform sizing, greater capacity

If you have been using woven wire screens or perforated metal screens with square or round openings, you will find that you can increase capacity, get more accurate sizing with CROSS HEXCREEN. The unique configuration of CROSS HEXCREEN (hexagonal shaped perforations), gives you more open area and less weight than equivalent square or round hole screens, yet provides the sizing accuracy of round type (see example at right).

CROSS HEXCREEN is specially designed for sizing granular products such as coal, coke, sand, gravel, crushed stone, slag, limestone, minerals and ores. CROSS perforated steel screens, made from long wearing CROSS Special Analysis Steel, are available in a wide range of sizes with uniformly spaced square, hexagon or round perforations, staggered for increased capacity and efficiency. For additional information on CROSS Perforated Screens write for complete catalog.

* T.M.



NS NATIONAL STANDARD COMPANY

Cross Perforated Metals

NATIONAL-STANDARD COMPANY

Carbondale, Pa.

New pit...new Caterpillar machines...

Alexco Aggregates Inc. completely equipped their new Glen Lake, Minn., operation with Caterpillar machines. This includes two Cat Diesel Engines to operate crusher and shaker, two Cat Electric Sets to supply power for the conveyor system. The pit supplies road materials ranging in size from 1½" crushed rock to ¾" asphalt aggregates.

A Cat No. 977 Traxcavator with side dump bucket loads in excess of 3,000 tons per 10-hour day—stockpiles too.

"This machine is ideal for our pit," says Superintendent Bill Grimme. "It's fast, increases production, and is easy on the operator."

Look at these features that pay off in more speed and volume for bigger profits:

Reduced Cycle Time—Less Loading Area—turning to load is unnecessary with the exclusive 2¼-yd. side dump bucket. Maneuvering is confined to forward-reverse movement.

Top Efficiency—Less Load Time—operator has good visibility to cast material accurately and with little spillage. Lift, tilt and dump levers are located for one-hand control. With float and lock-out mechanism, operator can release levers while bucket is in motion. An automatic positioner returns the bucket to desired digging angle. And the bucket can be tilted backward a full 40° at ground level to pry a full load on every pass.

NOW . . . A TOUGHER NO. 977 SERIES D: new track links for greater strength and longer wear; hydraulic track adjusters, already standard on the Series E, now available for the Series D.

FOR THE SERIES E MODEL: new lifetime lubricated rollers and idlers that need no servicing until rebuilding. New triple grouser track shoes, for added traction in soft materials, have low turning resistance and longer wear. The No. 977A Bulldozer has new durability . . . offers added versatility to the No. 977 Traxcavator.

top production from the start

Two D8s with "U" blades make every pass pay off... stockpiling and 'dozing material into crusher hopper.

With the No. 8U Bulldozer you get the shearing action of an angling blade . . . plus the rolling action of a straight blade. Material is forced to the center of the blade where a capacity load is carried the full length of the pass. Spillage over the top or out the sides is reduced. Tests show that 'dozing production is *increased up to 50%* when you replace a conventional blade with a Caterpillar "U" blade.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BORN OF RESEARCH
PROVED IN THE FIELD

THERE'S A NEW D8...
THE SERIES H
WITH THESE NEW FEATURES:

POWER SHIFT TRANSMISSION—with the exclusive torque divider that combines efficiency with fluid motion. Changes speed, direction instantly, under full load and with a flick of the fingers. Direct drive and torque converter drive also available.

MORE HORSEPOWER—235 HP flywheel. More power, more production.

BIGGER BY 4,700 LB.—Track gauge increased to 84"; length of track on ground now 114"; square inches of contact now 5,050.

LIFETIME LUBRICATED ROLLERS AND IDLERS—and they are bigger and tougher.

DRY-TYPE AIR CLEANER—removes at least 99.8% of dirt in the intake air—service in five minutes.

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For accurate reproduction of bulk material formulations—W-C BATCH-WEIGHING SYSTEMS

In any batching operation—from simple dump-and-fill weighing to multi-ingredient ratioing — W-C Batch-Weighing Systems provide the reliably accurate net-weight control essential to consistent product uniformity.

Chief reason for this is the W-C Pneumatic Weight Transmitter. A rugged yet sensitive force-balance unit, it is capable of an accuracy of ±0.25% calibrated weight range, with reproducibility better than 1 part in 2000.

Each W-C Batch-Weighing System is designed to job specifications, using pre-engineered, unitized components of *known* performance capabilities. Consequently, you are spared the uncertainties—and costs—of "prototype" engineering . . . yet you realize the very tangible benefits of an application-engineered system built to your requirements.

Typical applications include: Batching limestone, caliche, rock, slag, etc. in formulating product ingredients.

Write for new Bulletin 14

W-C

WEIGHING & CONTROL COMPONENTS, INC.
Div. of CompuDyne Corp.

E. County Line Road • Hatboro 14, Pa.
S.A. 2123

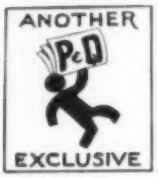
Enter 152 on card, page 169

Legal Decisions

On Industry Problems

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Contract Law is Simple



IT is important to realize that contract law is relatively simple. Ordinarily, both parties to a contract may avoid liability for breach by complying with the exact terms of the contract as may be interpreted by a person with average intelligence. Hence, neither party to a contract may avoid liability if he fails to fulfill the terms of a contract as may be decided to be reasonable by an average jury.

Last month, for example, a higher court held a company liable in damages to a land owner because it removed more valuable topsoil than was needed to excavate sand and gravel under a lease contract.

Also, this court held that where the lessee wrongfully opened a drain and permitted the escape of valuable fish from a pond, the lessee must pay reasonable damages to the lessor, although no positive testimony was given as to the actual value of the escaped fish.

Also, the lessee was held liable in damages to the lessor for failure to continue removing sand and gravel from the land for the 20-year term of the lease, although the contract contained a clause which the lessor erroneously believed gave him the right to abandon the land whenever he decided.

For illustration, in *Buchanan v. V. Cement Company*, 340 Pac. (2d) 556, the testimony showed that a land owner, named Buchanan, signed a contract under which he leased his land to the V. Cement Company for a term of 20 years. By the terms of the lease contract the V. Cement Company was prohibited from "stripping and wasting" the land. Also, the lease contract contained a clause which provided that the company would continue to operate the property in a good and workmanlike manner, "so long as it is feasible to do so within the judgment of the V. Cement Company."

During its operations the V. Cement Company's employees opened a drain and permitted the escape of fish which Buchanan had stocked in a pond situated on the land. Also, the company unnecessarily removed certain topsoil.

Buchanan filed suit against V. Cement Company and asked the court to hold the latter liable in damages for failure to continue to operate the lease for 20 years and to pay him the agreed royalties for sand and gravel removed from the land.

The legal counsel for the V. Cement Company contended that, in view of the above clause in the lease contract, the company could abandon the leased land at any time its officials believed continued operations would be unprofitable. The testimony showed that at the time the lease contract was signed the V. Cement Company then had a contract with another company, that later was cancelled, which resulted in the V. Cement Company's desire to discontinue operations on Buchanan's land before termination of the lease contract.

The higher court held that the V. Cement Company was liable to Buchanan for $7,327.70 for breach of the 20-year lease contract. The court said:

"Unless the contract by its terms expressly vests in the defendants (V. Cement Company) the absolute right of determining when they shall operate the properties, the court should not adopt such a construction. There is nothing in the language of the contract and in its context to indicate an intention of the parties to confer upon the defend-

ants (V. Cement Company) a right to refuse to operate the properties and extract gravel therefrom without reason. This court is constrained to the view that there is sufficient evidence to justify a jury in making a finding that there was a breach of contract in this respect on the part of the defendants (V. Cement Company)."

The higher court also held the company liable in heavy damages to Buchanan for removing topsoil not actually required to be removed. The court said:

"The proofs are that the topsoil was taken from an area far distant from the location of the gravel operation."

Buchanan testified that he had conceived the idea of stocking a pond with bass which he planned to raise commercially. For this purpose he purchased fish on two separate occasions at a total cost of $278. He estimated the number of fish from 30 to 40 thousand. He testified that he had fed and cared for them over a period of time at a cost in excess of $1,800.

Although the cement company contended that Buchanan could recover no damages because he could not prove how many fish had escaped, the higher court awarded Buchanan $2,200 damages, saying:

"Appellant (V. Cement Company) argues that there is not sufficient evidence as to the value of the fish loss. There was evidence that the appellants opened a drain to the fish pond. There was testimony of eyewitnesses to the escape of fish. The appellants' wrong in opening the drain and permitting the fish to escape is hardly open to dispute. Under those circumstances the appellants are not to be immunized for their wrongful act because perchance the respondent (Buchanan) is unable to prove with mathematical precision the dollar value of the loss. But the verdict was well within the proofs."

Disputed Contract

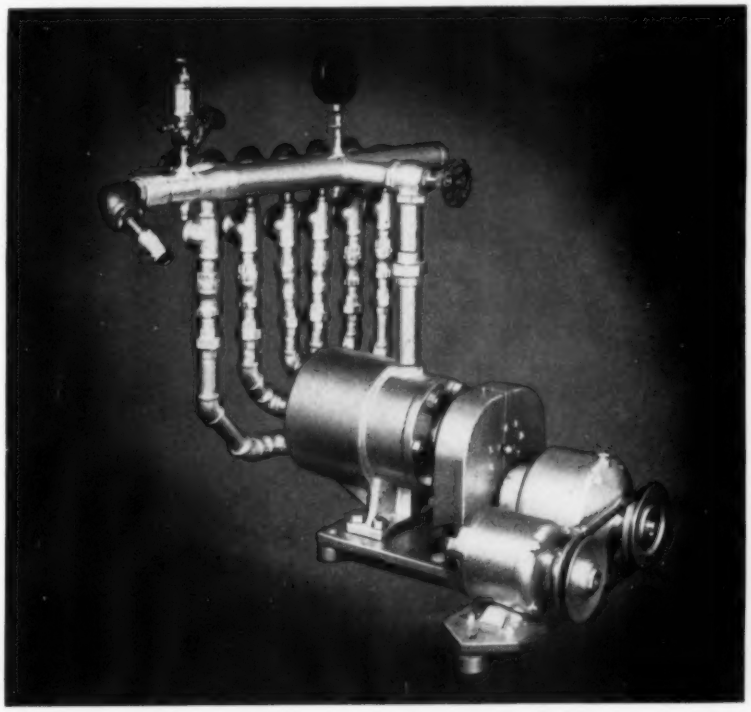
The fact that a contract may not at first hand appear to a jury, or lower court judge, to justify a damage judgment does not mean that the higher court will concur with this decision.

For example, in *Texas Sand & Gravel Company v. Procter & Gamble Manufacturing Company*, 267 (2d) Fed. 827, the testimony showed facts, as follows:

Responding to a letter of inquiry sent out by the Procter & Gamble Manufacturing Company, the Texas Sand & Gravel Company made a bid for the placement of fill and the purchase of gravel under the fill on the former's property. Texas Sand & Gravel claimed that soon afterward it entered into a contract with Proctor & Gamble and made extensive preparations to perform the gravel excavation and fill, but that it was forbidden access to the property and prevented from carrying out the contract. The Texas Sand & Gravel Company asked the court to award it heavy damages.

During the trial the Procter & Gamble Manufacturing Company admitted that it had solicited bids and that the Texas Sand & Gravel Company had made a proposed bid, but denied that it had made a contract with the latter.

The district judge heard testi-



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The Manitowoc Central Control Valve is a self-contained, fast acting unit complete with air manifold and valve drive. Shown above is a motor-driven central control valve regulating air supply to six slurry agitators. It can be timed with great precision to suit any desired operating cycle and any electrical current characteristic. The entire unit is mounted on a common bed plate with driving mechanism fully enclosed and automatically lubricated.

The Manitowoc Slurry Agitator is designed to use air on an intermittent cycle —as supplied by the Central Control Valve—as economically as possible, and at the same time employs a unique method of piping that prevents the air line from plugging.

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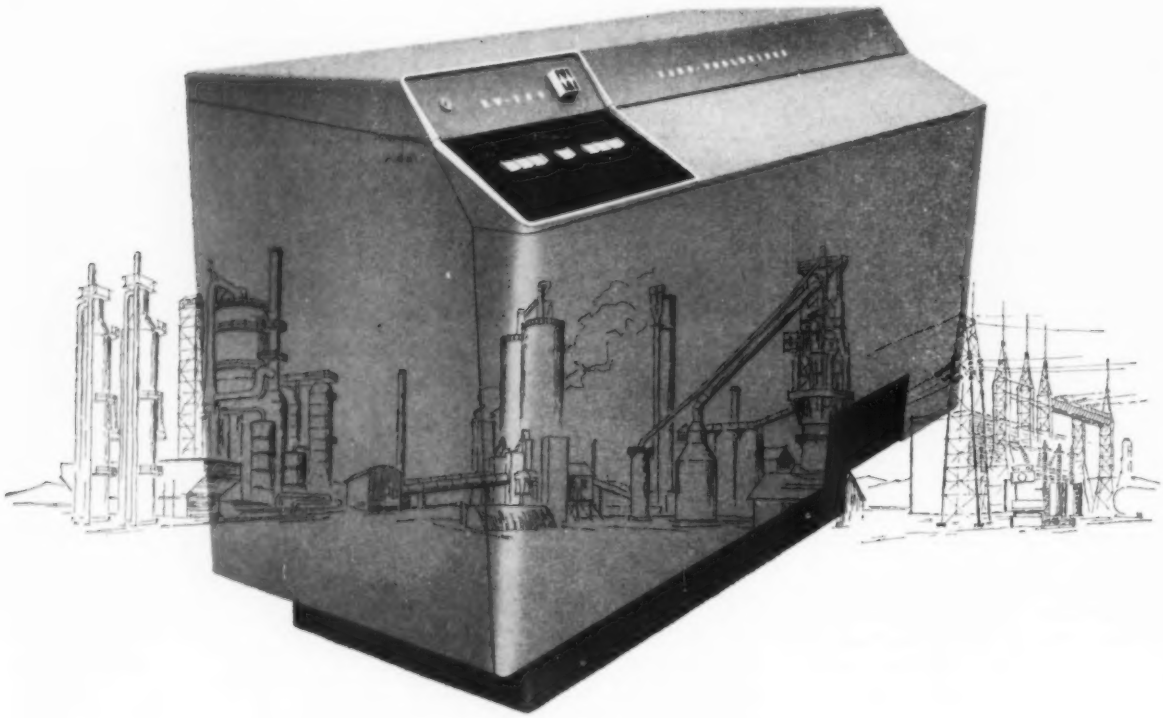

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OPERATING SYSTEMS incorporating the RW-300 for on-line control and data reduction are demonstrating these tangible benefits: *reduced costs, increased output, improved quality.*

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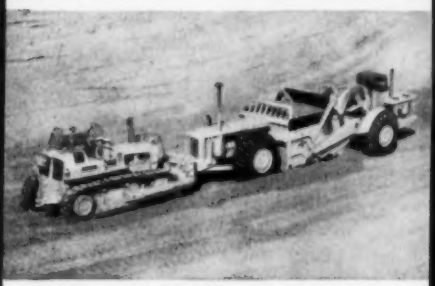
At a coal stripping operation in Pennsylvania, this TC-12 removes overburden at a rate of 400 to 500 yds. per hour. It is equipped with 16' blade...works two 8 hr. shifts a day.



Euclid Twin-Power teams — TC-12 Crawlers and TS-24 Scrapers — move over a million yds. a month at this Wyoming open pit uranium operation.

Model C-6 crawler back-filling overburden in the pit . . . full-power shift, good visibility and fast response make this "Euc" a high production machine for mine and quarry work.

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mony of several witnesses and then entered a judgment dismissing the suit with prejudice.

The higher court reversed this verdict, stating that although the district judge was earnestly endeavoring to determine the controversy in justice, he erred in dismissing the suit without granting leave of the Texas Sand & Gravel Company to amend its petition and complaint to prove that a contract did exist.

This higher court went on to explain that under any and all circumstances each party to a disputed contract will be given ample opportunity to prove his case, irrespective of what a jury or lower court judge may have decided.

Cannot Cloud Issue

Recently a higher court held that neither contracting (party) will be permitted to introduce testimony designed or intended to obscure the true issue. With respect to a contract under which merchandise or equipment is sold on the installment payment plan, and the purchaser defaults in making agreed payments, the only issue is whether or not such a contract gives the seller a lawful right to repossess the merchandise or equipment.

For example, in *U Sales Company v. Hansen,* 245 Fed. (2d) 951, the testimony showed that a person, named Hansen, purchased certain equipment and signed a conditional contract specifying the amount due on the equipment and future monthly payments. Hansen failed to make the agreed payments and the sales company filed a suit to replevy the equipment in his possession.

The case became very much confused by irrelevant arguments presented by both Hansen and the seller. The higher court held that in such a suit the only judiciable issues were the existence of a valid contract whose terms gave the seller a legal right to repossess the equipment, and the damages the seller suffered because Hansen retained the equipment.

This court explained that in a suit by a conditional seller to replevin merchandise from the purchaser who defaulted in making agreed payments, the only issue is whether the conditional contract between the buyer and seller gives the latter a legal right to repossession when the buyer fails to make specified payments. If so, the seller can repossess the merchandise or equipment although the purchaser presents irrelevant testimony which tends to cloud this issue.

Must Prove Contentions

Another important point of law decided recently by a higher court is this: A party who sues another party for damages must positively prove that the party being sued caused the claimed damages; otherwise, a favorable verdict will not be rendered for the party filing suit.

For illustration, in *Co-De Company v. Combs,* 325 S. W. (2d) 78, a property owner, named Combs, sued the Co-De Company for heavy damages to buildings caused by rock and debris which had been cast upon his premises. A verdict was returned in favor of Combs, because the testimony proved that the Co-De Company owned property on a much higher level of land, and someone had caused rocks and debris to roll down the mountain, damaging Combs' property.

However, Combs produced no testimony proving that employees of the Co-De Company had caused the rock and debris to roll down the mountain, and the higher court reversed the lower court's decision on the basis that Combs had not proved positively that the Co-De Company had caused the alleged damages.

Placer Mine Fraud

Sometime ago a reader wrote an interesting letter, in part, as follows: "If two parties are in disagreement over the boundary lines of placer mining claims, can either of these parties advantageously prove that the other party practiced fraud in locating or filing his claim?"

A recent higher court decision holds that in a possessory lawsuit of this kind to quiet and establish title to a placer mining claim on unappropriated government land, neither party to the suit can raise the issue of fraud, as it is a matter of which the government alone can take advantage.

For instance, in *Rundle v. Republic Cement Corporation,* 341 Pac. (2d) 726, the testimony showed that certain California, Nevada, and Arizona limestone deposits proved to be unsuitable for the manufacture of cement. Accordingly, one Prigge and other locators sought out and located other limestone deposits suitable and valuable for manufacturing cement. Republic Cement bought these placer mine claims.

Later a man named Rundle contested the validity of the Republic Cement Corporation's mining claims, claiming first that he held title to land included in these claims; and second, that Republic Cement's title was void and defective because Prigge and other locators had practiced fraud when obtaining their title to the claims later sold to the cement firm.

It is interesting to observe that the higher court refused to consider these alleged fraudulent acts and held the Republic Cement Corporation's title valid, saying:

"The evidence stands uncontradicted that a very substantial sum of money was expended in connection with the location and development of these placer claims. This covered such items as expenditures for monumenting, core drilling, surveying, geologist, roads, erection of a small building, shipment of raw material, etc. We hold that in this 'possessory action' the defendant (Rundle) is not entitled to raise the issue of fraud as it was a matter of which the government alone can take advantage."

Sand vs. Quartz

Several weeks ago a higher court rendered an important and interesting decision to the effect that the product the S. J. Sand Company mines is sand which entitles a 5 percent depletion deduction, rather than quartzite, which would entitle a 15 percent depletion deduction. This court held that sand could not be considered as quartzite where the testimony showed that quartzite is thought of as a compact granular rock, as distinguished from sand which is understood to constitute small separate grains.

For instance, in *S. J. Sand Company v. Commissioner of Internal Revenue,* 267 Fed. (2d) 591, the testimony showed that the S. J. Sand Company mined or dredged sand from certain deposits. The process consisted of removal of the topsoil

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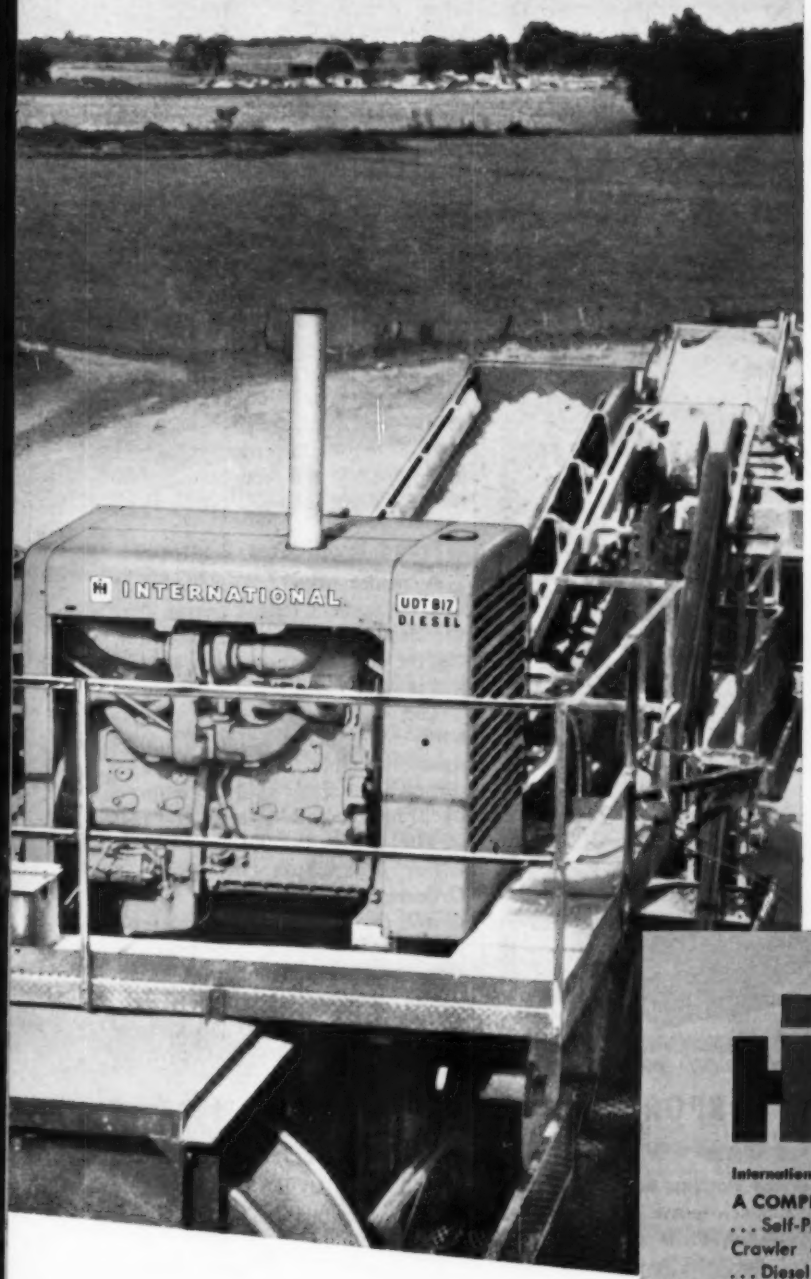

Reports Co-owner Eugene Nelson, of Madison Stone Construction Co. "When we contracted to supply Wisconsin's new Highway 49 with 50,000 tons of crushed rock at $1.56 per ton, we knew our profits would depend on continuous high production. For this we turned to International power. We aimed at a production rate of 180 tons per hour, but have been able to load a 15-ton truck every four minutes, or well over 200 tons per hour! Specifications called for crushing the hard Niagara limestone to one inch. We needed more power, but wanted a smaller unit, and this turbocharged International fills the bill."

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until the sand was exposed. Dredging removed the sand through pipe lines to screening stations. After screening and washing, the sand was transported to concrete storage silos where it was stored and dried. The sand was then sold to a distributor who further processed it and sold it to glass manufacturers principally.

The primary chemical content of the sand, 98.98 percent, was silicon dioxide. This factor, plus its low iron element, 0.151 percent, made it useful for glass manufacture. The sand has the crystallographic structure of quartz and is angular in appearance. It is the result of disintegration of a type of rock formed, through cementation, by a silica cement, of sand grains.

The legal counsel contended that the S. J. Sand Company was entitled to a 15 percent depletion deduction on its product because it is quartzite. The higher court refused to agree, saying:

"The product S. J. Sand Company mined and marketed was admittedly sand. We are here dealing with and guided by what Congress meant by its unmistakable affirmative distinction between quartzite as such and sand. The statute allows the 15 percent depletion for quartzite not for glass manufacturing substances. All ordinary definitions of quartzite and sand stress the visible, readily discernible dissimilarities between the two: quartzite, the hard compact rock; sand, hard small grains."

Compensation Not Awarded

Recently a higher court definitely held that unless an employer is given notice of injury and the claim is acted upon by the Industrial Board, the courts have no jurisdiction to hear and determine a suit for compensation based on such injury. This is so although the employee mistakenly filed a notice in good faith.

For example, in *Mozley v. Longhorn Portland Cement Company*, 324 S. W. (2d) 925, it was shown that a man named Mozley died on July 2, 1957, allegedly as a result of an injury which he received while employed at Longhorn Portland Cement Company. The widow filed a notice of fatal injury and a claim for compensation within the time, as provided by the State Workmen's Compensation Act. In both the notice of fatal injury and claim for compensation, she described the cause of death as being "sudden on the job strain which caused rupture of aortic aneurysm into midesophagus." The Industrial Accident Board, after proper hearing, refused the claim.

The widow then filed a suit to recover compensation, alleging that Mozley had died as a result of an "accidental" injury. No notice had been given the Longhorn Portland Cement Company that Mozley's death was due to an accidental injury. Therefore, the higher court refused to award compensation to Mozley's widow, saying:

"It is well settled that unless the employer is given notice of the injury and the claim is acted upon by the Industrial Accident Board, the courts have no jurisdiction to hear and determine a suit for compensation based on such injury. The law is also well settled that a claimant cannot file for compensation for one injury and sue and recover judgment for a different injury."

Fraud Invalidates Contract

A reader asked: "If a seller of used equipment tells a person that the machinery is in good condition, can the person refuse to pay the bill if it is worn out?"

The higher courts very consistently hold that a seller of equipment is liable for full damages caused a purchaser who was induced by "fraud" to enter into the contract of sale.

For illustration, in *Meyer & Greenwald Const. Co. v. Salina Gravel Co.*, 277 Pac. 274, the testimony showed that a seller sold to a stone and gravel company a steam shovel. The gravel company paid $1,000 down, paid freight charges amounting to $346, and gave its notes for the balance due.

After the employees of the gravel company had unsuccessfully endeavored to operate the shovel, the officials complained to the seller that the machinery was worn out.

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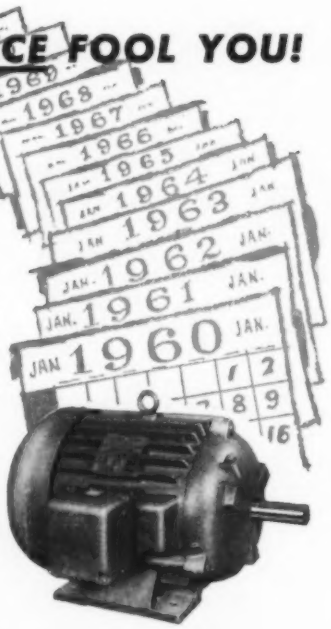

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Later the company sued the seller for cancellation of its notes, repayment of the down payment and the freight charges, and loss of time and expense in endeavoring to operate the shovel.

During the trial the officials of the gravel company introduced testimony proving that for the purpose of inducing the sale the seller had written letters stating that the shovel was in "good" condition.

In view of this evidence the lower court held the seller fully liable, and the higher court indicated its approval of the decision, stating important law, as follows:

"If the contract was induced by fraudulent representations, and if the defendant (gravel company) within a reasonable time after discovery of the imposition offered to rescind the contract, the gravel company is entitled to recover and entitled to have the notes cancelled, to recover the down payment, and also the amount paid for freight."

Purchaser's Breach

A quarry company asked: "If a property owner signs a written contract to purchase a designated quantity of crushed rock at a definite price per ton with a stipulation that he will order the material out before December 1, what is our legal status if the property owner delays ordering the material out until after December 1? Can we refuse to make delivery unless the property owner agrees to pay a higher price per ton?"

The answer is: If the property owner fails to order the material delivered to him before December 1, he is guilty of breaching the contract and the seller may refuse to make delivery unless the property owner signs a new contract to pay a higher price for the material.

On the other hand, it is certain that until December 1 the contract is in effect and the seller is liable in damages to the purchaser if he fails to deliver the materials at the price specified in the contract. As above mentioned, if the purchaser breaches his contract, the seller may refuse to make any deliveries of materials; but, if the seller ignores the seller's breach, and without complaint makes deliveries after December 1, he automatically becomes obligated

THOROUGH DUST COLLECTION!

Pangborn Dust Control eliminates float dust at Mexico Refractories

At Mexico Refractories Co., Div. of Kaiser Aluminum and Chemical Corp., Frostburg, Md., at least 7,000 tons of raw material a month pass through crushing, grinding and other dust-generating operations. To control and collect the resulting vast quantities of dust, two Pangborn Dust Collectors were installed.

These units provide thorough dust collection . . . every dust particle collected is returned to the process. As a result of Pangborn Dust Control, the air is free of float dust and good working conditions prevail. Although the company does not keep records on the amount of dust collected, it has found that salvage has been substantial. Mexico Refractories is highly satisfied with the effective, economical and trouble-free performance of Pangborn Dust Control.

If dust is a problem in your plant, talk to the Pangborn man in your area or write PANGBORN CORP., 5300 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Dust Control and Blast Cleaning Equipment—Rotoblast Steel Shot and Grit.*®

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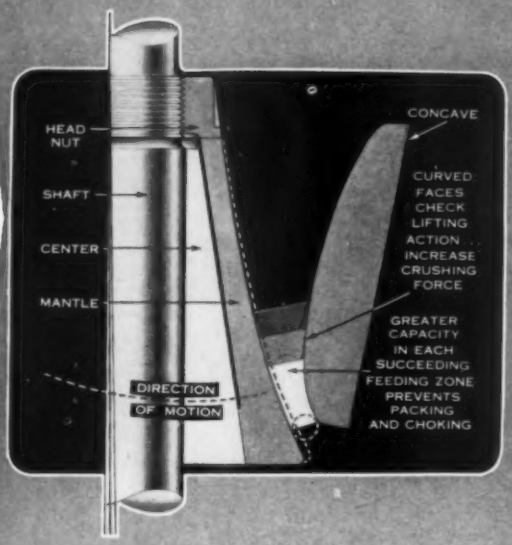
Traylor-made for uniform secondary reduction

Traylor TY Reduction Crushers require minimum floor space and little head room, with features that combine high production, economy of operation and lower maintenance costs.



Traylor's curved concaves used in the TY Crusher enable operators to secure large tonnages of small product of uniform size with low percentage of oversize and waste fines. Traylor TY Reduction Crushers are built in six sizes from 1'-3" to 5'-6" and with feed openings from 3" to 22". Write for bulletin #8112 today!

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Bethanized Coating Protects Wire Rope in Koepe Hoist—You're looking at Bethlehem Wire Rope serving on a Koepe hoist at the Cliffs Shaft Mine of Cleveland-Cliffs Iron Company. This installation calls for something special in rope service, because lubricants on the operating ropes have to be held to the minimum. And conditions in the shaft are "wet." The rope (a flattened strand for the hoist cables and a special non-rotating type for the tail lines) has been in service for months, thanks to the outstanding corrosion-resistance of the bethanized coating. This is a heavy-duty armor which protects the steel wires with a smooth, uniform layer of pure zinc.

Bethlehem Wire Rope made with bethanized wire has another important advantage in mining applications due to the ductile zinc coating serving as an internal lubricant for the rope. Bethlehem produces wire rope in a variety of bethanized coating weights, so as to meet virtually any type of operating condition.

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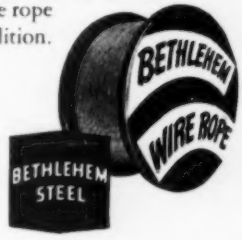

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When you buy a used machine you expect it to make money for you. And if you don't make money because it "wasn't what the man claimed it to be," you've made a bad deal . . . lost money. But there's no such risk when you buy from a Caterpillar Dealer. Here's why: He reconditions, classifies and guarantees his trade-ins to take the guess and gamble out of your buying. Because he does a lot of trading, he offers a wide selection of rigs—machines you can buy at realistic prices. For example:

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2. **A "CERTIFIED BUY"** covers units of any make in good condition. Machines with lots of life and profit left in them. This type of protection carries the dealer's written guarantee of satisfactory performance.

3. **A "BUY AND TRY"** deal is more than its name implies. It means a fair buy for the price asked. You are protected with the dealer's written money-back agreement. Something you won't get at most used equipment lots.

Only a Caterpillar Dealer will provide you with bonded protection, or written protection of any kind. He will also back you with prompt service and parts you can trust. You'll find a Cat Dealer listed in the Yellow Pages. Visit his used equipment lot for the best buys on the market. Compare his values with anyone else's . . . you'll soon join the family of satisfied Caterpillar customers.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

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BEST BUYS IN NEW AND USED EQUIPMENT

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to fulfill the exact terms of the original contract.

For illustration, in *Stand Company v. Oklahoma Board*, 14 Pac. (2d) 281, the testimony showed these facts: The commissioners of a county entered into a contract with a seller on August 5, whereby the latter agreed to furnish the county a stipulated quantity of rock asphalt at a specified price per ton. The contract further provided that the materials would be delivered at the named price within ten days after the seller received from the county engineer written orders for delivery of the materials. The contract also provided that the county would order deliveries of all materials before June 30. The county engineer failed to order any materials to be delivered until the following July 23. Hence, the county breached its contract by failure to order out any of the material before the date of June 30, specified in the contract.

Without making any complaint, the seller delivered to the county certain materials ordered out by the engineer after July 23. Soon afterward a disagreement arose between the county commissioners and the seller who then contended that his obligation under the contract had ceased on June 30.

The higher court held that since the seller had filled the delayed order of July 23 without complaint, he became obligated to fulfill the exact terms of the original contract, and he could recover no extra price for the materials.

This same law is applicable to contractors and all others who continue to perform work under a breached contract although aware that a situation has arisen under which they may repudiate and cancel the contract.

For illustration, in *Natural Asphalt Corporation v. Carter*, 297 S. W. 1114, the testimony showed that a company made a written contract with one Carter whereby the latter, for a stipulated price, agreed to quarry, crush, and load on barges at the plant a minimum of 50,000 tons of natural rock asphalt between March 1 and December 31. On June 9, Carter ceased operations under the contract, and notified the company that he had abandoned it. At that time he had quarried,

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Ever twist a head off a bolt because it wasn't *strong* enough . . . or scrape your knuckle when your wrench "rounded off" the head because it wasn't *hard* enough? It's not likely to happen if you use Cat all-purpose bolts and nuts. They're highest quality in every way. For example, Cat bolts exceed Grade 6 in all requirements as rated by the Society of Automotive Engineers. Grade 5 is the average rating of bolts used in other earthmoving equipment.

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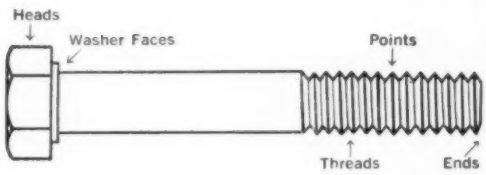
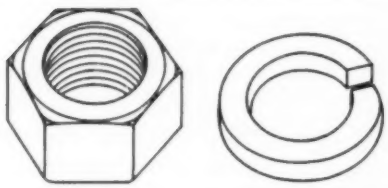
If you need tougher, stronger hardware—get Cat all-purpose bolts and nuts. You can count on them to do a better job longer because they're stronger and harder than others.





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SERVICE TIP: Get your free copy of Caterpillar's bolts and nuts reference booklet at your Caterpillar Dealer today. It has the sizes, threads and part numbers listed for quick, easy ordering. Before buying any hardware, check Cat prices first.

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crushed, and delivered on barges only 3,554 tons of the materials, whereas the contract provided that by June 9 he should deliver 11,000 tons.

The company sued Carter for $200,000. Carter defended the suit, and asked for damages on the contention that he had been induced to enter into the contract through a misunderstanding. However, since Carter had not previously complained to the company's officials, the higher court held the company entitled to recover full damages from Carter, and said:

"A party who claims to have been defrauded in the execution of a contract must assert this defense within a reasonable time after he has discovered the fraud, or else he will be deemed to have waived his right to rely on the alleged fraud in the execution of the contract."

Zoning Ordinance Void

A higher court held that where relatively small inconvenience may result to owners of residences, a city ordinance which restricts the extension of the operations of an established quarry is invalid.

For illustration, in *Herman v. Village of Hillside,* 155 N. E. (2d) 47, the testimony showed facts, as follows: A city passed an ordinance which restricts the further use and extension of certain land for quarrying purposes. The testimony showed that on this land was a deposit of dolomite, a high medium magnesium carbonate, commonly known as limestone, in excess of 280 ft. thick. It is quarriable, is used primarily for building and road construction, and meets the specifications for coarse aggregate of the State Highway Department.

Herman's grandfather commenced quarrying operations on the tract many years ago. Since 1929 the present quarry company and its predecessors have continued operations, on a much larger scale, on a semicircular 8½-acre tract off the east side thereof.

The higher court promptly held the ordinance void and invalid as to this tract of land and, also, as to an adjacent tract that was usable for quarrying purposes. This court explained that the owners and lessee of the tracts would sustain severe loss if extension of the quarrying operations was prevented, as compared to relatively small increase in inconvenience to owners of residences in the neighborhood. The court said:

"The people who built residences, most of whom built in 1948, have little room for complaint. Their homes were built in the face of an existing outcropping limestone deposit which has been exploited in varying degrees of intensity for many years."

Not Totally Disabled

Considerable discussion has arisen from time to time over the legal question: If an injured employee is capable of doing any kind of work, can he receive compensation payable for total and permanent disability?

The answer is ordinarily in the negative.

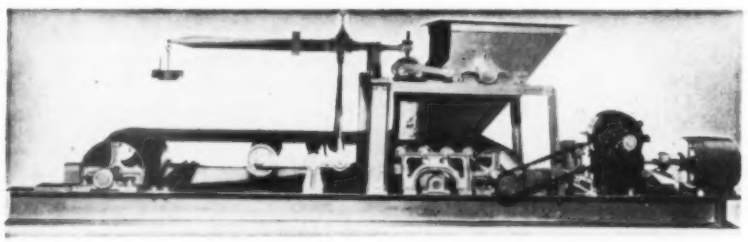
In *Golconda Portland Cement Company v. Industrial Commission,* 153 N. E. 594, it was disclosed that a workman sustained a double hernia while lifting a heavy object. The employee worked for sometime after sustaining the injury, but he was unable to assist in heavy lifting. He filed suit for compensation under the State Workmen's Compensation Act on the basis of total disability. The court refused to grant the allowance, saying:

"An award for permanent total disability and a pension for life is justified only in case the employee is rendered wholly and permanently incapable of work . . .While the evidence in this case tends to show that it is reasonably certain that defendant (workman) will be partially permanently incapacitated by reason of the hernia, unless it is reduced by an operation, the evidence in the case fails to show that it is reasonably certain that he will be permanently totally incapacitated."

LUCIAN A. LINCOLN has been appointed to the position of director of industrial relations for Material Service Corporation of Chicago. For the last four years he has been associated with the law firm of Schradzke, Gould and Ratner, specializing in labor relations matters.

SCHAFFER POIDOMETER

. . . is insurance against discrepancies in WEIGHING, BLENDING, MIXING, FEEDING, RECORDING and PROPORTIONING



OVER 1600 NOW SERVING IN PLANTS THROUGHOUT THE WORLD

WRITE FOR CATALOG NO. 5

By installing a Schaffer Poidometer you have complete assurance against costly errors. A Schaffer Poidometer pays dividends—because all operations are handled to "PERFECTION-PLUS." They're dependable and eliminate production line snags. Poidometers are available with remote control devices for showing and changing feed rate, and total weight recorders.

SCHAFFER POIDOMETER CO.

2828 SMALLMAN ST. PITTSBURGH 22, PA.

Enter 164 on card, page 169

Enter 165 on card, page 169 →

Make a "spec check"...

See how Haulpak® ...cuts haul costs

LW engineers "threw away the book" when they designed the new Haulpak off-road hauler... for your benefit. The results are advantages that help you move *more* tonnage, *faster*, at *lower* net cost per ton.

Check Haulpak specifications. You'll want "spec sheets" in your files anyway, and your LW Distributor can supply you copies. Then, with basic Haulpak facts handy, compare them to other off-road haulers.

WHAT YOU WILL FIND WHEN YOU COMPARE HAULPAK:

(Competitive hauler specifications are "averaged out" for simplicity purposes... but Haulpak superiority is just as clear over any single machine.)

WHAT TO COMPARE	Off-road Haulers 20-30-ton class		Off-road Haulers 30-40-ton class		HOW YOU BENEFIT
	Average*	Haulpak LW 27	Average*	Haulpak LW 32	
Length Wheelbase Turn Diameter	26'7" 14'4" 64'3"	23'10" 10'10" 44'6"	31'5" 16'7" 77'6"	23'10" 10'10" 44'6"	HAULPAK is shorter. You maneuver faster, quicker and in less space.
Top Speed (in mph)	30.7	35.4	25.2	38.8	HAULPAK is faster, for more cycles per hour, more tonnage per shift.
Empty Weight (in lb)	49,300	43,020	73,400	44,950	HAULPAK is lighter, for more payload weight, less "dead" weight.
Ground Clearance Front Axle Rear Axle	 16" 16"	 25" 20"	 17¼" 18½"	 25" 20"	HAULPAK has higher clearance, to minimize troublesome "dozing" action.
Brake Surface (sq inches)	1511	4680	1834	5148	HAULPAK has bigger brakes, for greater safety, more steady use of high speeds.

(*Based on specifications available at time of printing)

and here are some of the design features that make these HAULPAK advantages possible...

Hydrair* suspension...eliminates springs...permits higher clearance, shorter turns

Cushions against loading and travel shock, cuts maintenance costs. Eliminates front axle, compensates for off-center load. COMPARE IT!

"V"-shaped body...lets Haulpak outcarry trucks that are longer, higher, heavier

Bonus yardage rides in V-bottom. Slope helps fill all corners. "V" lowers center of gravity for better stability, traction. COMPARE IT!

Box-beam frame...3 times stronger, ⅓ lighter, carries 30% more payload weight

Floor and all wear-surfaces made of 100,000 psi steel, yet weighs 33% less than comparable bodies. Haulpak hauls 30% more than its weight. COMPARE IT!

PLUS: MINIMUM MAINTENANCE (entire lube-check, needed only at 500-hr intervals, consists of just 4 easy-to-reach grease fittings)... POWER-TRANSFER DIFFERENTIAL (famed Tournapull® feature which automatically transfers power to wheel on best footing when going is rough)... POWER-MISER FAN (cools with 20 to 25 less hp drain)... 100% RUBBER-MOUNTED BODY (absorbs impact and shock of loading)... FOUR SEPARATE BRAKING SYSTEMS (for fast stops with complete safety)... POSITIVE POWER STEER (for faster turning, easier handling)... SIMPLE SIX-GEAR FINAL DRIVE (compared to 12 or more usually standard)... BIG, ROOMY CAB (has many work-efficiency features).

Available in 22, 27, and 32-ton capacities

*Trademark HP-2193-DC-1

LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

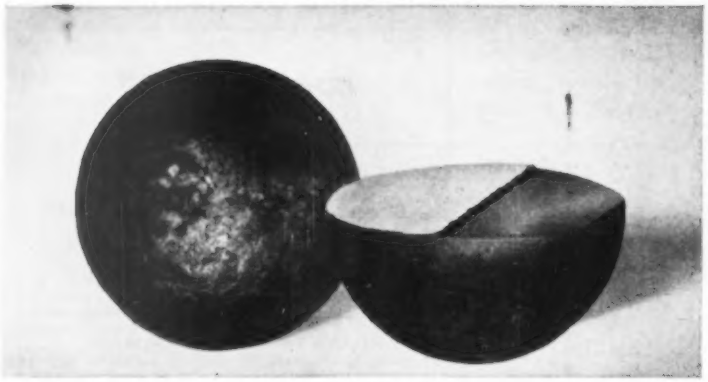
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

consistently

UNIFORM

grinding economy



Ball after ball, charging after charging, carload after carload—uniformity is a sure thing with Moly-Cop Balls. Uniformity of toughness and hardness. Uniformity of fine, dense grain structure. Uniformity of longer service, less down time and better grinding at lower cost. That's the result of Sheffield quality control in alloying, forging and heat treating—from furnace to finished ball.

SHEFFIELD
ARMCO
MOLY-COP
COPPER-MOLYBDENUM-ALLOY
Grinding Balls

The Standard of Comparison Around the World

SHEFFIELD DIVISION

Sheffield Plants in Kansas City, Tulsa and Houston

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Nearly 700 acres in this pit

. . . but fast LW tractor works every "corner" of it

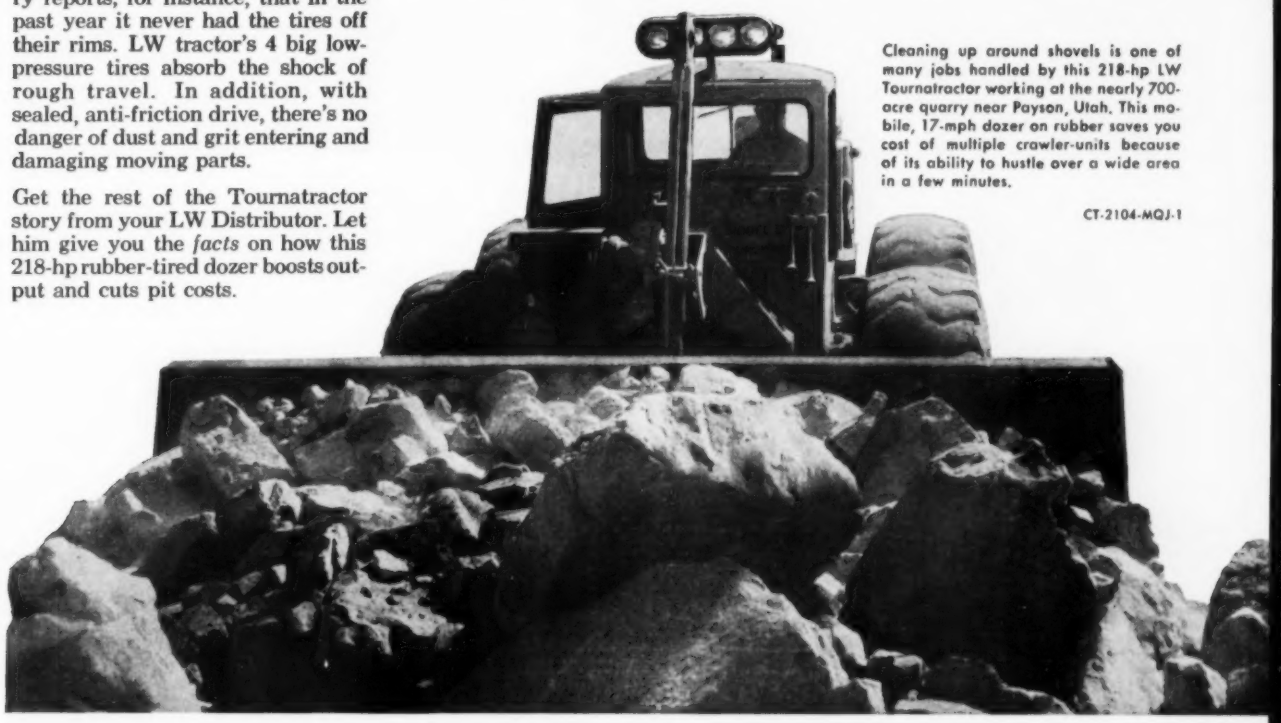
At the Keigley Quarry, Payson, Utah, about 700,000 tons of limestone and dolomite are produced per year. On this nearly 700-acre site — owned by the Columbia-Geneva Steel Division of United States Steel Corporation—a LW Tournatractor® handles a wide variety of jobs. This LeTourneau-Westinghouse rubber-tired dozer cleans up around shovels, maintains stockpiles, sometimes strips overburden, pushes railcars, tows compressors . . . and maintains 10 miles of roads!

Travels up to 30 mi per day

One of the main reasons this single Tournatractor can handle *all* these jobs for Keigley Quarry, is its ability to *run* from one assignment to the next. There's no time lost "crawling" between locations. During a normal work day at the big quarry, this 17-mph LW tractor travels a total of 25 to 30 miles.

Maintenance costs for Tournatractor are relatively low, too. The quarry reports, for instance, that in the past year it never had the tires off their rims. LW tractor's 4 big low-pressure tires absorb the shock of rough travel. In addition, with sealed, anti-friction drive, there's no danger of dust and grit entering and damaging moving parts.

Get the rest of the Tournatractor story from your LW Distributor. Let him give you the *facts* on how this 218-hp rubber-tired dozer boosts output and cuts pit costs.



Cleaning up around shovels is one of many jobs handled by this 218-hp LW Tournatractor working at the nearly 700-acre quarry near Payson, Utah. This mobile, 17-mph dozer on rubber saves you cost of multiple crawler-units because of its ability to hustle over a wide area in a few minutes.

CT-2104-MQJ-1

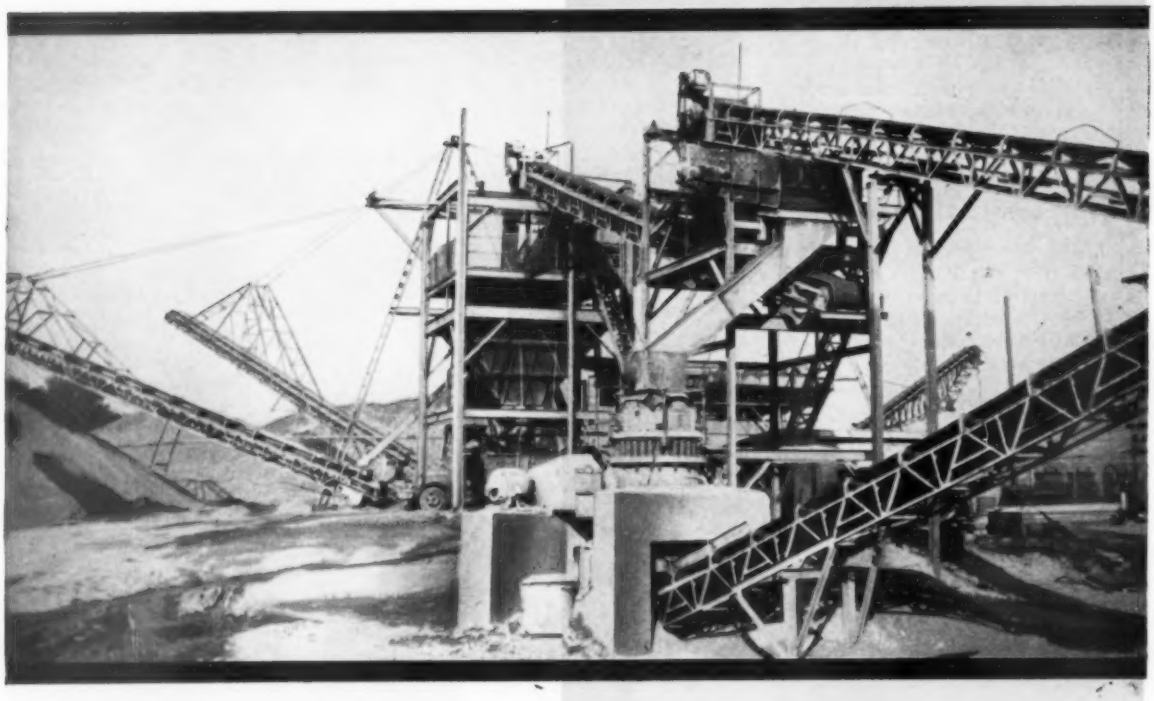
LW

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

HOLLY MANUFACTURING AND MINING COMPANY processes 300-400 tons of gravel per hour with 5 SIMPLICITY screens!



Write for information on Simplicity equipment today.

At the Holly Manufacturing and Mining Company, Holly, Michigan, pit run gravel is brought from the pit to a surge pile on belt conveyors. From the surge pile, a belt conveyor takes the gravel to a Simplicity 5′ x 14′ Model "D" 2-deck screen. At this point, all oversize material, including rocks up to 8 inches in diameter, is run through a cone crusher and then re-circulated to the screen. A belt then takes all through material to two Simplicity M-11 4′ x 12′ 3-deck screens where the gravel is washed, sized, then stockpiled to be used as needed. The other 2 Simplicity screens are used for processing special products.

All 5 Simplicity screens have been in operation for over two years, part of the time on a two-shift schedule, with a minimum of down time.

Gravel plant operators are getting quick, economical and dependable processing of their material with Simplicity Screens, Feeders and Conveyors.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 12, MICHIGAN

220

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario.
FOR EXPORT: Brown & Sites, 50 Church Street, New York 7, N. Y.

more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

CEDARAPIDS SUPER COMMANDER CRUSHING PLANT, newly designed to include a twin-jaw primary crusher, is described in 18-page Bulletin SC-1, issued by *Iowa Manufacturing Company*. New features which give the Super Commander approximately 20 percent greater capacity than the standard Cedarapids Commander are detailed. On-the-job photos show the Super Commander in a variety of job conditions. **(301)**

A CONVEYOR CHAIN DESIGN HANDBOOK has been compiled by *Moline Malleable Iron Company* for use in the selection of chain for conveying and elevating. Correct applications of chains to conveyor systems and factors in selecting chains are outlined and illustrated. Also included are comparison charts, graphs of friction coefficients, installation tips, maintenance pointers, and a trouble shooting chart. **(302)**

A COMPRESSOR BULLETIN from the *Le Roi Division, Westinghouse Air Brake Company,* illustrates and explains 22 features of the lightweight Le Roi Model 125RG2 portable rotary compressor, which delivers 125 c.f.m. of air at 100 p.s.i. at a speed of 1,600 r.p.m. **(303)**

MODEL 95 PAYHAULER, a 27-ton, rear-dump, off-the-highway truck is featured in a catalog released by *International Harvester Company*. The catalog describes the body design, which trims gross vehicle weight by 5,000 lb., and features such as the power train, the main frame and support members, Torqmatic brake, and the enclosed power steering system. **(304)**

EQUIPMENT FOR THE PROCESS INDUSTRIES manufactured by *Fuller Company,* is described in a 12-page bulletin. Discussed are applications and performance characteristics of the company's equipment. Operating principles are explained, and photographs show typical installations. Drawings, schematic illustrations, and tables of dimensions and capacities supplement the text material. **(305)**

A WALL CHART OF CONVERSION FACTORS has been published by *Precision Equipment Company*. Included are common conversions such as inches to centimeters or watts to hp., as well as many conversions that are difficult to locate in reference manuals. **(306)**

"OPERATION STOPWATCH," a time and motion study of crawler tractor efficiency, has been prepared by *J. I. Case Company*. It contains the results of a comprehensive time and motion study conducted by Case engineers to evaluate the comparative efficiency characteristics of the Case 1000 diesel and other leading machines. **(307)**

AN ARC WELDING SUPPLY CATALOG from *Hobart Brothers Company* gives information on the complete line of Hobart arc welding accessories and supplies, including head shields, grinding shields, goggles, cleaning tools, electrode holders, cable connectors, ground clamps, work holding clamps, welding cables, protective clothing, welding gloves, and miscellaneous equipment. **(308)**

DIESEL ENGINE MAINTENANCE is the topic of "Ten Maintenance Steps," a booklet prepared by *Cummins Engine Company, Inc.* Information tells power users how to increase equipment availability, reduce operating costs, and obtain better engine performance. **(309)**

HOWE LOAD CELL WEIGHING SYSTEMS, available for installations involving 500 lb. to hundreds of tons, are covered in a brochure issued by *The Howe Scale Company*. Typical heavy-duty applications are described and illustrated. Detailed drawings and photographs describe the actual operation of this load cell system. Components are illustrated and their relationship to the overall system is explained. **(310)**

FEBRUARY PIT AND QUARRY 1960

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

VOID AFTER 60 DAYS.

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Name_____ Title_____

Company_____

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City_____ Zone_____ State_____

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Pit and Quarry Publications
431 South Dearborn Street
CHICAGO 5, ILL., U.S.A.

more information, please

Use postcard to receive literature or details on new equipment and products reported in this issue.

ROTO-GUARD MOTION INDICATOR is now available in explosion-proof construction as well as general purpose construction. Both types are detailed in Bulletin RG-21, published by *The Bin-Dicator Company*. Included are specifications, a description of typical applications, installation and adjustment data, and an explanation of operating principles. (311)

A NEW GREASE CARTRIDGE packed with Gulflex A, a multi-purpose, lithium-base grease, and fitting all cartridge-type grease guns, is described in a bulletin from *Gulf Oil Corporation*. (312)

HOSE FITTINGS AND HOSE for industrial applications are described in a fully illustrated catalog published by *Lenz Company*. Pictured and detailed with specification tables are reusable hose fittings, assemblies, adapters, and single and double wire braid hose. Diagrammed assembly instructions are included. (313)

HYDROVANE ROTARY STATIONARY COMPRESSORS for 100-lb. service are featured in a new *Davey Compressor Company* bulletin containing specifications, a description of design features, and photos showing actual installations. (314)

AN "ELECTRODE POCKET GUIDE" just issued by *Air Reduction Sales Company* contains complete information on all types of electrodes available from Airco. Under each electrode listed there is a brief description, with application, procedures, and other pertinent data. Charts of recommended Airco electrodes for welding A.S.T.M. and trade name steels are included. (315)

ELECTRIC MOTOR CONTROLS are discussed in Catalog 5900 from *Furnas Electric Company*. This catalog contains descriptive copy and design data for manual starters and other motor control products and accessories. Selection charts for magnetic and manual starters give horsepower, motor speed, heater size, ampere ratings, and enclosure choices. (316)

THE DOUBLE LOADSTER, a heavy-duty auxiliary axle made by *Natchez Steel Products Company* for on- and off-the-highway operation, is detailed in a descriptive folder from the manufacturer. Designed for top of the frame mounting on any model truck, the Double Loadster is a self-contained unit which retracts automatically when the truck is unloaded. (317)

CONVERTA-SCREEN HEATING EQUIPMENT for low voltage resistance heating of vibrating screens is described in a brochure from *Screen Heating Transformers, Inc.* Features are described and actual installations are illustrated. (318)

INDUSTRIAL CATALOG NO. 204, containing descriptive information about Aeroquip hose, fittings, self-sealing couplings, and related products, has been released by *Aeroquip Corporation*. The catalog includes specifications and a hose selector chart which lists the various applications and fluids for which specific hose types are recommended. Instructions for assembling hose lines are also provided. (319)

AMERICAN 300 SERIES CRAWLER CRANE-EXCAVATOR is the topic of a catalog from *American Hoist and Derrick Company*. The literature details design features of the machine and illustrates its use on various jobs, such as crane, magnet, clamshell, dragline, shovel, and backhoe. (320)

MODEL B TOURNAPULL, a 28-cu. yd., 360-hp., self-propelled scraper in the *Le Tourneau-Westinghouse Company* line, is the subject of a brochure just released by the company. Details of construction are supplemented with illustrations of components and on-the-job photos. (321)

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____Payment enclosed ____Bill me ____Bill company

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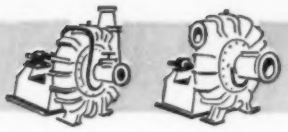
*U. S., U. S. Possessions, and Canada only.

Pan American countries, $10 a year; elsewhere, $15 a year.

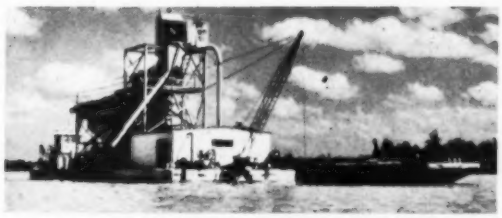


WAS HE SURPRISED!!

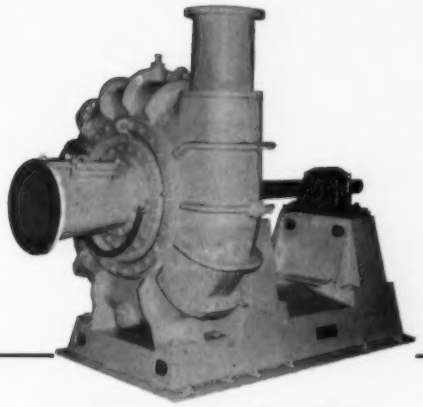
THOMAS

DURABLE DREDGE PUMP

NEEDED NO REPAIRS



Suction dredge of W. D. Jeffrey-Sand Department in use on Arkansas River at North Little Rock.



W. D. JEFFREY—SAND DEPARTMENT
P. O. BOX 188
PHONE FRANKLIN 9-7817
NORTH LITTLE ROCK, ARKANSAS

November 27, 1959

Thomas Foundries, Inc.
P. O. Box 1111
Birmingham 1, Alabama

Gentlemen:

Thank you for inspecting our pump on November 19 as per our request.

Our Series JL Thomas (10") Pump has been in constant use for 18 months and we expected wearing parts would be needed by this time. It was gratifying to find we have at least several more months life in the impeller and liners.

This is a very busy season with us and any down time would be very inconvenient as well as costly. We are glad we have a Thomas Pump.

Yours sincerely,

W. D. Jeffrey

This sand and gravel operator naturally expected extra long service life from the Thomas pump he bought for his new dredge because he knew THOMAS pumps had wide reputation for durability. But after 1½ years of service, he assumed the pump needed repairs. November 4 he wrote to ask us to send him one of our service men and necessary pump repair parts.

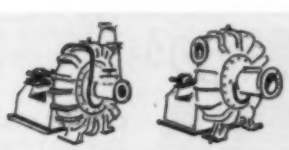
The Thomas engineer duly arrived, took down the pump, and to Mr. Jeffrey's surprise and gratification it was found that the impeller and liners were good for several more months of service!

Do you wonder that Mr. Jeffrey closes his letter of Nov. 27, 1959 above by writing: "We are glad we have a THOMAS pump"?

Sand and gravel operators throughout the U. S. enthusiastically agree with Mr. Jeffrey. They all know from experience that THOMAS pumps give longer life and higher sand and gravel production. The reason is special pump design permitting use of genuine Thomas Ni-Hard alloy iron in all wearing parts.

"You cannot buy at any price a more DURABLE PUMP FOR SAND AND GRAVEL—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

(Available in sizes from 6" to 16" discharge)



THOMAS FOUNDRIES Inc.

P. O. BOX 1111, BIRMINGHAM, ALABAMA

What makes MANITOWOC

a great quarry shovel?

Here's the straight story

More pit operators turn to Manitowoc every year for big, steady output with the lowest maintenance cost. They've found that these husky shovels stand up to the grinding punishment of quarry work without sacrificing power, speed or operating ease. Following are just a few of the basic reasons why you should see your Manitowoc distributor right now for the full, profitable story.

A SOLID, WIDE-SPREAD BASE with a one-piece carbody mounted right on the crawler frames. No amount of hard rock digging can affect the rugged crawler base.

COMPACT, POWERFUL MAIN MACHINERY makes full use of every unit of horsepower. Line pulls exceed normal requirements to give you reserve capacity.

A FAST CYCLE WITH DIRECT POWER-FLO drive provided by the unique Manitowoc slide pinion arrangement. Only working gears turn — all others are disconnected until their function is needed.

UNDER-DRIVE, TWIN DIPPER STICKS take the shock of rock in stride . . . deliver a more powerful crowding action at the dipper.

STURDY, ALLOY STEEL BOOM welded in elongated tubular form easily meets the extraordinary bending and twisting stresses of quarry work.

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

SHOVELS
1¼ to 6 YDS.

Manitowoc

CRANES
25 to 125 TONS

"Our 16000 and 21000 diesels have plenty of reserve power, with economy and dependability to boot,"

says S. T. Kimmes, partner, Kimmes-Bartelma Construction Co. of Hastings, Minn. "It's this kind of performance that proves I'm right in specifying Allis-Chalmers across the board."

An HD-16 tractor, powered by a 16000 diesel, pushes sand and gravel to the crushers—these crushers are also driven by 16000 and 21000 diesels.

A 16000 diesel powers this hopper at the pug mill.

21000 — 340 hp
(turbocharged)
16000 — 230 hp

Supplying and placing more than a million tons of subbase material for runways at a new midwestern Air Force base is typical of the jobs handled by the Kimmes-Bartelma Construction Co., Hastings, Minnesota.

Kimmes' aggregate plant shown above turned out 8,000 tons per day. These Allis-Chalmers 16000 and 21000 engines logged over 1,500 hours in three months. The only downtime on this job was due to wet weather.

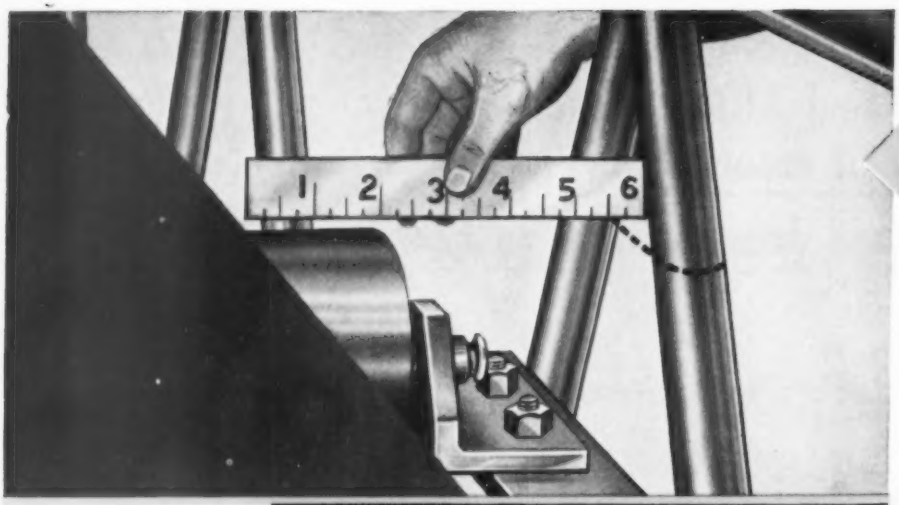
Why is Kimmes' operation Allis-Chalmers-powered all the way? Because as he puts it: "These engines are in there giving us real performance day in and day out with no strain — in the tractors, on the crushers, and at the pug mill." They deliver the power and torque they are supposed to without overworking. The completely new Allis-Chalmers open-chamber combustion system makes the 16000 and 21000 the most economical, cleanest-running, fastest-starting diesels in their class.

Let your Allis-Chalmers dealer tell you more. Let him refer you to users — find out what they think of these "Performance-Proved" engines. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

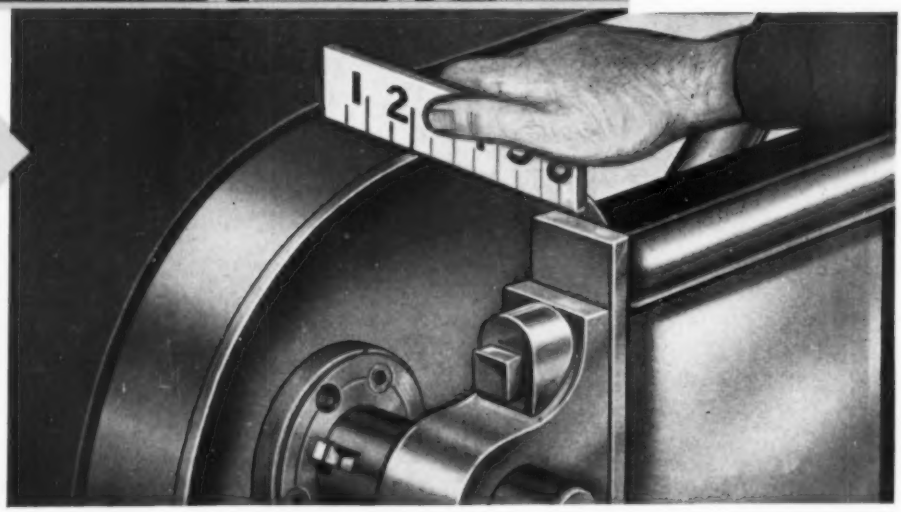
***POWER* FOR A GROWING WORLD**

BC-23



WIDER FRAME...
MARCO Tubular Frames are widest in the industry. They provide 100% more space (5½") in the critical area... between belt edge and nearest frame member. Pedestal type return idler brackets are used, instead of hanger brackets that confine and damage belt.

WIDER FACE PULLEYS...
MARCO is first with modern pulley specifications. 2" between belt and pulley edge... provides 100% greater protection than outmoded standards. Reduces possibility of belt destruction caused by "belt wandering" in high tension areas.



WHY RISK COSTLY, CONVEYOR BELT DAMAGE?

Only wider, MARCO Tubular Frame Conveyors provide maximum 'belt-edge' protection

Repairing or replacing conveyor belt represents the largest maintenance expense in a conveyor installation. To prolong belt life, MARCO conveyors are first to have all these belt-protecting features.

Wider Frame: Completely outmodes other conveyors that narrowly confine and damage belt should severe 'belt-wandering' occur.

Wider Face Pulleys: MARCO'S wider frame permits the use of modern, wider face pulleys to further protect belt from damage should 'belt-wandering' occur.

All Tubular Members: MARCO Tubular Frames are more rigid. Constructed of the strongest known structural member, these frames are modern ...and resist material and water build-up. Sharp 'belt-cutting' edges are eliminated with this exclusive construction.

Rigid Joint Construction: Another MARCO exclusive... 4 bolts in each connection... 16 in each joint. Not the usual 1 or 2 per connection. Joints are more rigid. Resists frame misalignment, simplifying belt training and increasing belt life.

If wind, uneven loading or other factors should cause 'belt-wandering'... with a MARCO frame you have the most complete protection possible against costly 'belt-edge' damage. This greater protection is yours at no greater cost.

MARCO'S Quality and Exclusive Features Mean More for Your Conveyor Dollar...

Remember, your conveyors are not mere plant accessories... they deserve the attention of a specialized manufacturer offering modern specifications, carefully and properly designed to meet your most exacting requirements. It will pay you to check MARCO quality, exclusive features and proven performance record before you buy.

For more information see your Marco distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Mo.

MARCO*

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engineered MARCO products:

Tubular Frame Belt Conveyors · Conveyor Idlers · Solid and Self Cleaning Steel Pulleys
Bucket Elevators · Control Gates · Feeders · Bins

Manufacturers' News

Appointment of CARL E. HELLERICH as manager of the Wichita district, and of FRANK R. HUNTER as manager of the Minneapolis district for the Allis-Chalmers Industries Group has been announced.

Mr. Hellerich had been a sales representative in the Omaha district since 1951. He joined Allis-Chalmers in 1949.

Mr. Hunter, manager of the Wichita district since 1951, succeeds M. J. KROEGER, who retired December 31 after 44 years with Allis-Chalmers.

Climax Molybdenum Company, New York, N. Y., a Division of American Metal Climax, Inc., has named JOHN V. HOUSTON JR. assistant manager of West Coast sales and development. Operating from Climax' Los Angeles office, Mr. Houston will be concerned with all of the various molybdenum products, spending a large portion of his time with iron and steel foundries and users of ferrous castings.

Before joining Climax Molybdenum, Mr. Houston was an eastern sales manager for a foundry department of American Brake Shoe Company.

PAUL SCHROEDER has been appointed vice-president of manufacturing of the Kensington Steel Division of Poor & Company, Chicago, Ill.

Mr. Schroeder started at Kensington Steel in 1950 as plant industrial engineer, and became plant superintendent in 1959, from which position he is now being advanced.

Waukesha Motor Company, Waukesha, Wis., has named R. A. D'AMOUR to the post of assistant sales manager. Mr. D'Amour joined Waukesha in 1952 and has served for the last seven years as sales engineer with a territorial assignment in the midwest area.

Promotion of JOHN R. THORNTON to California district manager for Atlas Copco Pacific has been announced. Mr. Thornton has served as the company's resident sales engineer on the Arch Dam, Utah, project during the last year.

In his new post he will be responsible for sales of Atlas Copco air compressors, rock drills, and related equipment in California, southern Oregon, and Nevada.

J. R. Thornton

W. G. Barnes

Bucyrus-Erie Company, South Milwaukee, Wis., has appointed WILLIAM G. BARNES as sales manager, blast hole drills. He will report to George D. Grayer, manager of sales for the drill division.

Mr. Barnes, who joined Bucyrus-Erie in 1956 as a sales representative on the Mesabi iron range, had been sales engineer for blast hole drills since the fall of 1958.

DON L. HINMON and R. F. ORTH have been elected senior vice-presidents of the Johns-Manville Corporation, New York, N. Y.

Mr. Hinmon, general manager of the Johns-Manville Industrial Insulations Division, New York, will also administer operations of the company's Fiber Glass Division at Toledo, Ohio, in his new office as vice-president for Industrial Divisions. Mr. Hinmon joined the Johns-Manville organization in 1936 at Los Angeles.

Mr. Orth, general manager of the Johns-Manville Pipe Division, joined the company in 1924. He has represented Johns-Manville in Chicago and St. Louis.

Challenge Manufacturing Company, manufacturer of the Challenge Pacemaker truck mixer, and Cook Bros. Equipment Company, manufacturer of heavy-duty trucks and truck equipment and world-wide distributor for Challenge truck mixers, have merged into one corporate group to be known as Challenge-Cook Bros.

The new corporation entities growing out of this working alliance have been formed to maintain the same manufacturing, financing, leasing, and merchandising activities of the predecessor organizations. Manufacturing plants are located at Los Angeles and La Mirada, Calif., and Bryan, Ohio.

Announcement of the formation of the new organization was made jointly by J. Ross Castendyck, owner of Challenge Manufacturing Co., and Howard and Charles Cook, owners of Cook Bros. Equipment Co. Mr. Castendyck will serve as board chairman of the new group, with Howard F. Cook as associate chairman.

Joseph E. Hall, former executive vice-president of Cook Bros., has been named president. R. E. Swarthout, executive vice-president of Challenge, will become first vice-president, and Evan S. Prichard will be vice-president in charge of engineering. D. L. Adams will be vice-president of the Bryan, Ohio, corporation.

The new firm will maintain general offices at the former Cook Bros. location at 3334 San Fernando Road, Los Angeles. Engineering and plant offices will be maintained at the former Challenge La Mirada plant.

H. K. Porter Company, Inc., Pittsburgh, Pa., has established a world-wide marketing and distributing subsidiary in Geneva, Switzerland, to be known as H. K. Porter & Cie., S. A. This new subsidiary has acquired a plant in Holland for the manufacture of industrial and automotive friction products.

CHARLES R. SPENCER has been named field sales manager of the Gates Rubber Company, Denver, Colo.

Mr. Spencer, who has been manager of distributor sales since 1957, will now be in charge of over 200 field representatives in the U. S.

Eaton Manufacturing Company, Cleveland, Ohio, has announced that, effective January 1, its wholly-owned subsidiary, The Cleveland Worm & Gear Company, and the latter's subsidiary, The Farval Corporation, became divisions of Eaton under their respective names.

GEORGE H. ACKER, president of Cleveland Worm & Gear and Farval, has been appointed general manager of the two divisions, with full administrative responsibilities.

Mr. Acker joined the engineering department of Cleveland Worm & Gear in 1923. He was elected a vice-president in 1942 and in 1952 became executive vice-president of the company and its Farval subsidiary. He was named president in 1957.

DR. CHARLES E. REED has been appointed general manager of the Chemical and Metallurgical Division of the General Electric Company, succeeding Vice-President ROBERT L. GIBSON who has been named general manager of the company's Transformer Division in Pittsfield. Prior to his new appointment, Dr. Reed was general manager of the company's Metallurgical Products Department in Detroit.

Hardinge Manufacturing Company, a subsidiary of the Hardinge Company, York, Pa., plans a $300,000 expenditure for the expansion and modernization of its foundry facilities. The enlarged foundry will embrace approximately 32,000 sq. ft. of floor area, and will include the latest in core ovens, and sand mixing apparatus, cranes, and other materials handling equipment.

WILLIAM C. LYTLE has retired as vice-president of the Atlas Powder Company, Wilmington, Del., after a diversified career spanning almost all of the company's history. Mr. Lytle has the distinction of having directed or managed at one time or another each of Atlas' major divisions. He had been handling special assignments for the president since last September.

ROBERT R. SCHULTZ, 50, who had been associated for 25 years with the crushing, mining, and road machinery industries, died late last year. For the last nine years he was executive vice-president and general manager of the Rogers Iron Works Company, Joplin, Mo.

● Newly-elected officers and directors of the Conveyor Equipment Manufacturers Association for 1959-60 are (front row, left to right): O. A. Johnson, president (president, Gifford-Wood Co.); J. B. Nordhold Jr., retiring president (president, Webster Manufacturing, Inc.); and E. H. Woodbarry, re-elected vice-president (manager, Industrial Products Div., Lamson Corp.). Back row, left to right: E. L. Weinthaler, director (vice-president, Conveyor Systems, Inc.); G. H. Woodland, secretary (vice-president—marketing, Chain Belt Co.); E. P. Berg, a past president who has just completed his term as director (general manager, Pershing Road Plant, Link-Belt Co.); H. A. Barber, treasurer (president, Barber-Greene Co.); and C. C. Sollenberger, re-elected executive vice-president to head the association staff.

GM Diesel's 1960 Service School Schedule has just been announced by Chester B. Clum, general service manager for the Division.

Programs of one, two, and three weeks, covering construction, operation, and maintenance of GM Diesel engines, have been planned and scheduled throughout 1960. Special two-week Power Generator Programs have been included in this year's schedule for those interested in the application and installation of power generators.

Copies of the 1960 schedule can be obtained from GM Diesel distributors and dealers.

Two important personnel changes in its West Coast sales organization have been made by American Air Filter Company, Inc., Louisville, Ky. RUSSELL C. TAYLOR has been named Pacific regional manager, with headquarters in San Francisco. At the same time, CHARLES J. BRESSOUD has been appointed manager of the Los Angeles branch office, succeeding Mr. Taylor.

Mr. Taylor succeeds Vice-President Richard H. Nelson, who has relinquished his responsibilities as regional manager but will continue as a director.

Mr. Taylor has been assigned to the Pacific region since 1951, and has been in the Los Angeles branch office since it was opened in 1952. Mr. Bressoud joined the Los Angeles office in 1954 as a sales engineer.

CHARLES W. HAINES has been appointed assistant to the chairman of the New York Rubber Corporation, Beacon, N.Y.

Two additions to the engineering staff of the American Hoist & Derrick Company, St. Paul, Minn., are ROBERT P. FOX, chief engineer—revolver cranes, hoists, and carriers, and E. W. TAYLOR, manager, Engineered Products Division. Mr. Fox was formerly chief engineer of the Clyde Iron Works, Duluth, Minn.; Mr. Taylor was vice-president and chief engineer of the Industrial Browhhoist Corporation, Bay City, Mich.

Enter 177 on card, page 169 ➔

Now "trade" dead weight for payload..and haul 40% faster!

Heap-load the big-target Payhauler body in minimum time. Strong rock-ribbed corrugations absorb shock—resist wear and distortion. Choose the "95" with power-shift Torque-Converter, or 9-speed air-shift transmission.

New strength-multiplying corrugated body design results in payload-gaining weight reduction of both International Payhauler models. New "95" capacity is increased to 27 tons—and the new "65" becomes the only 19-tonner on the market!

Look at those exclusive, rock-ribbed body corrugations! International applies this strength-multiplying principle to reduce Payhauler® body weight by an amazing 30%! You "trade" 2½ tons of power-wasting dead weight for 3 bonus tons of payload capacity in the new 95 Payhauler!

New high-torque, high-output diesel power highballs 27-ton payloads up to 40% faster than the former "95" could haul only 24 tons! The new 375 hp DT-817 International diesel engine gives the new 95 Payhauler the wallop of 40 extra turbocharged "horses."

Prove to yourself that top load-carrying capacity plus top power-to-weight ratio give 95 Payhaulers tremendous profit-earning advantages. Add up other big Payhauler exclusives: fast reverse, up to 7.1 mph. for spotting speed; big-target bodies for loading zip; 11-second inverted-hoist dumping; load speeding safety of torqmatic braking and positive power-steering! Let your International Construction Equipment Distributor demonstrate!

International® Construction Equipment

International Harvester Co., 180 N. Michigan Ave., Chicago 1

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers and Bottom-Dump Wagons . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

WEMCO, a division of the Western Machinery Company, San Francisco, Calif., has named three additional distributors to handle its complete line of aggregate processing equipment.

The Double-H Equipment Company, Syracuse, N. Y., will distribute WEMCO products in the central and northern portions of the state of New York.

Eastern Equipment Sales, Inc., will cover western Massachusetts from its Springfield office, and the state of Connecticut from its East Hartford office.

The Lively Equipment Company, Albuquerque, N. M., will cover all of New Mexico except the southern bank of counties along the Arizona and Texas borders.

The Critzer Machinery Company, Berea, Ohio, has been appointed a distributor for northern Ohio by the Koehring Division of Koehring Company, Milwaukee, Wis.

Several appointments that are a part of an expanded sales and service organization have been announced for the Euclid Division of General Motors Corporation, Cleveland, Ohio.

GERRY E. DANBY, formerly a sales representative in the western district and more recently in charge of sales training, has been appointed manager of the sales development department. He succeeds ALAN S. MCCLIMON who takes over the newly-created post of manager of national accounts.

LOUIS A. CAMPBELL has been named district sales representative in Montana and the Canadian Provinces of Alberta and Saskatchewan.

ROBERT J. SCHROEDER, formerly sales representative at Euclid's branch in Hibbing, Minn., has transferred to the southern sales region as district sales representative for Kentucky, West Virginia, and eastern Tennessee.

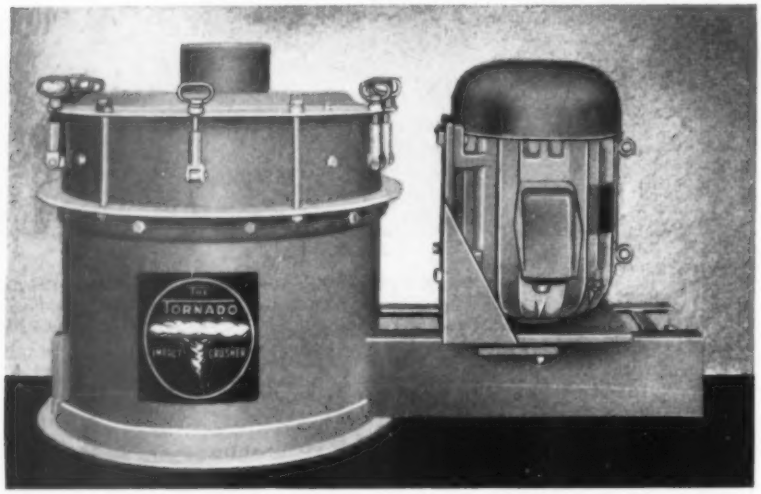
CHARLES T. GALLAHER and HOWARD W. MIDDLETON, former members of the sales development department at Cleveland, are now sales representatives at Euclid's Los Angeles branch.

GRAHAM ROSS has been appointed manager of sales of Worthington Corporation's Plainfield (N. J.) Division.

Mr. Ross joined Worthington in 1946 at Plainfield and has served in a number of assignments in the Construction Equipment Sales Department. His most recent position was manager of the Truck Mixer and Paver Sections.

A. FOSTER SHELLER has been named manufacturing manager of the Waukesha Motor Company, Waukesha, Wis. In his new position, he will supervise and coordinate activities of the departments within the organization directly concerned with, or closely related to, the manufacturing process.

EDWARD S. FROHLING has been named business development engineer, eastern district, by the Western-Knapp Engineering Company, San Francisco, Calif.



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Feature by feature, the Tornado Impact Crusher offers many advantages. In its category, generally, the Tornado represents one-half the initial cost with three times the productive capacity of other crushers. You're ahead with initial installation of the Tornado . . . you stay ahead during operation. Check and compare. See for yourself how the Tornado could improve your profit picture.

The TORNADO Challenges Comparison!

FEATURES	THE TORNADO	Crusher —A—	Crusher —B—	Crusher —C—	Crusher —D—
Low Initial Cost	Yes	No	No	No	No
Production	High	Variable	Variable	Variable	Variable
Power Requirements	Low	Variable	Variable	Variable	Variable
Men needed to install Replacement Parts	One	Three	Three	Four	Five
Time Required for Replacing Wear Parts	10 to 30 Minutes	1 Day	1 Day	3 Days	2 Days
Crane Necessary	No	Yes	Yes	Yes	Yes
Quality of Product	Excellent	Fair	Fair	Fair	Fair

WERCO Steel Company

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Send for our new descriptive brochure "The Key to Greater Profits"

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Where heavyweights move job records prove...
FIRESTONES CARRY MORE YARDS PER DOLLAR!

Get Firestone off-the-highway tires and get set to make more money! From planning stage to the finished project a combination of Firestone tires and Firestone Giant Tire Service adds up to bigger profits every time. Every Firestone off-the-highway tire is built with Firestone Rubber-X, the longest-wearing rubber ever used in Firestone tires. You get Firestone S/F (Shock-Fortified) nylon cord bodies to guard against impact damage. A *Firestone Tire Expert* will help you match tires exactly to the job and will handle all of your tire maintenance problems to turn downtime losses into worktime profits! Call your Firestone Dealer or Store today!

Always specify Firestone Tires when ordering new equipment

Super Rock Grip Wide Base (Nylon)* Super Rock Grip Deep Tread*

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BETTER RUBBER FROM START TO FINISH

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*Firestone T.M.

Buell Engineering Company, Inc., New York, N. Y., a producer of electrical and mechanical dust collecting equipment, has purchased the 49-year-old Northern Blower Company (Norblo), Cleveland, Ohio.

Under terms of the acquisition, L. A. Eiben will operate The Northern Blower Division of Buell as a vice-president within the framework of the Buell organization. Norblo manufactures bag-type dust collectors and filtering equipment.

REX A. SMITH, formerly manager of sales promotion and training, has been appointed to the position of assistant sales manager of the Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

Mr. Smith will serve jointly with Dave Van de Roovaart, who has been assistant sales manager for two years. Responsibilities will be divided geographically, with Mr. Smith handling the western half of the United States and Canada, plus northern Mexico. Mr. Van de Roovaart will be in charge of sales in the eastern United States and eastern Canada.

LOUIS W. JANDER, formerly assistant general sales manager, has been promoted to general sales manager of the Yale Materials Handling Division, The Yale & Towne Manufacturing Company, Philadelphia, Pa.

Mr. Jander succeeds Clyde R. Dean, who is now division general manager.

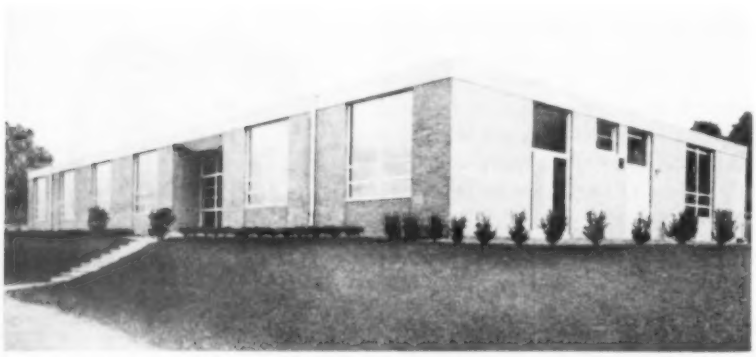
DICK CHINN, manager of market research, Massey-Ferguson Industrial Division, Wichita, Kans., has been elected to the presidency of the newly-organized Industrial Equipment Manufacturers' Council (affiliated with FEI.) Mr. Chinn was chairman of a by-laws committee named in Milwaukee last September to organize the new group.

Elected vice-president was John Scowcroft, assistant to the president, Sherman Products Corp. Jim Wormley (sales manager, Industrial Division, Deere & Co.) was elected treasurer.

The council was organized to encourage uniform specifications in the light industrial equipment field. Members include makers of loaders, backhoes, blades, forklifts, industrial or crawler tractors, and related equipment.

Plans for a $4,000,000 expansion of earthmover tire production facilities at Goodyear Tire & Rubber Company's Topeka, Kans., plant have been announced. New production facilities, when completed in 1961, will accommodate the maximum tire sizes—the largest sizes will measure close to 10 ft. from tread to tread and 3 ft. from sidewall to sidewall.

C. O. Bartlett & Snow Company has acquired the Wettlaufer line of vibrating screens, granulators, blender mixers, centrifuges, and packing units. This line of processing equipment was developed by William L. Wettlaufer, a Buffalo inventor.



● This new headquarters building of the Allen-Sherman-Hoff Pump Company at Frazer, Pa., will house the sales, service, and engineering staffs of the firm. Across the driveway at the left is the A-S-H moulding plant where the rubber parts are made for Hydroseal and Centriseal pumps.

An agreement to combine the Apex Machine & Tool Company, Dayton, Ohio, with the Gardner-Denver Company, Quincy, Ill., has been announced.

According to the announcement, Apex will become a wholly-owned subsidiary of Gardner-Denver on March 1, 1960. Apex will continue to operate under the same officers, produce the same products and sell through the same sales organization as at present.

JOHN C. PANGBORN, co-founder of Pangborn Corporation, Hagerstown, Md., died at his home in Hagerstown at the age of 75 years.

Mr. Pangborn, along with his brother, Thomas W., founded the blast cleaning and dust control manufacturing concern in New York City in 1904. In 1912 the company moved to Hagerstown. For many years he was active in sales, and in recent years served as vice-chairman of the board of directors and of the Pangborn Foundation.

Several executive changes, effective January 1, have been announced for the Anaconda Wire and Cable Company, New York, N. Y.

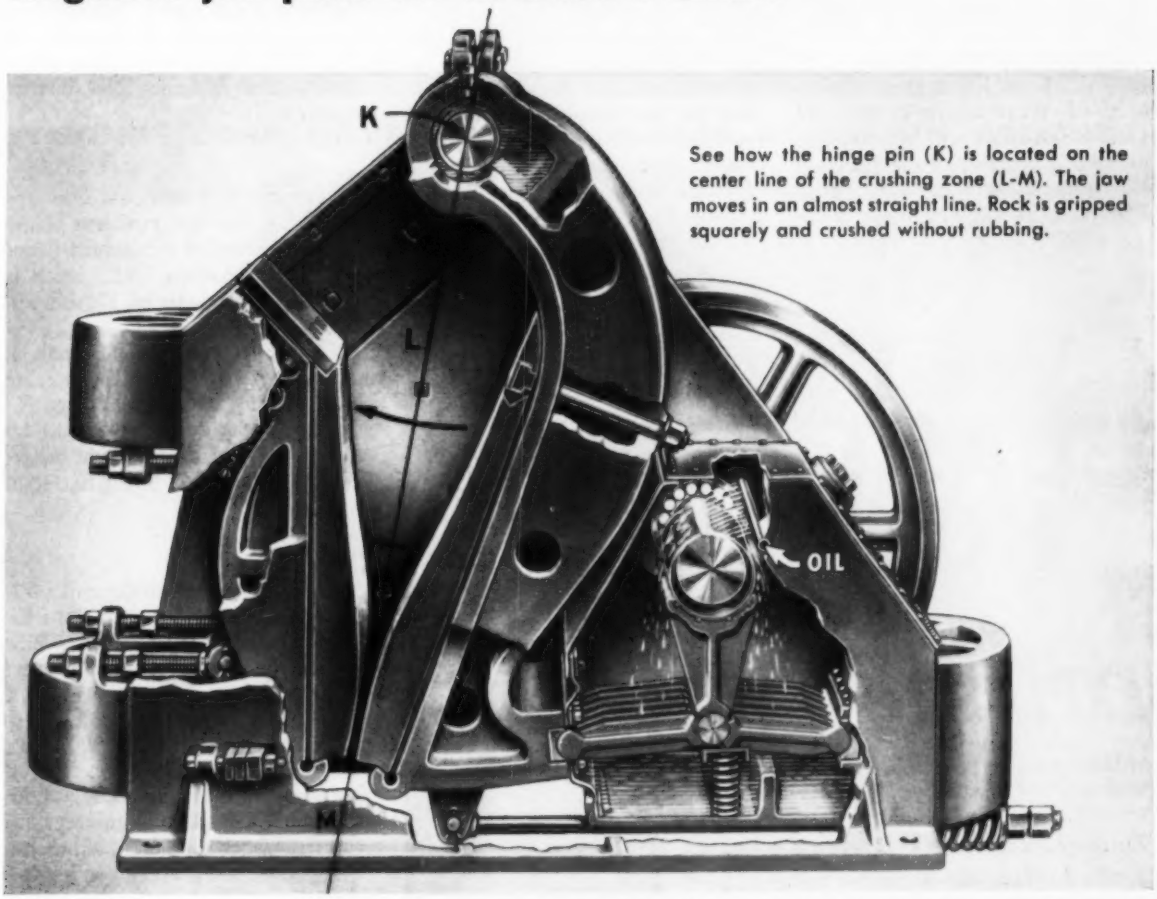
DAVID E. ALLEN, vice-president—sales, has been elected executive vice-president. He succeeds Richard B. Steinmetz, who was named president in October, 1959.

WILLIAM H. BENTON JR., formerly general manager of mills, has been elected vice-president—manufacturing. Mr. Benton succeeds Vito F. Di Lustro, who has retired.

Two new vice-presidents have also been appointed. They are JOHN L. TINDALE, formerly commercial vice-president, who has been advanced to the newly-created position of vice-president—marketing and sales; and HENRY V. VAN VALKENBURG, until now general sales manager, who has been elevated to vice-president and general sales manager.

ROGER H. JONES has been appointed sales manager in charge of metal producing industries for the Industrial Products Division of the Western Gear Corporation, Belmont, Calif.

KUE-KEN® "crushing without rubbing" saves on power . . . lengthens jaw plate life at least 5 times!



See how the hinge pin (K) is located on the center line of the crushing zone (L-M). The jaw moves in an almost straight line. Rock is gripped squarely and crushed without rubbing.

Take the high cost of crusher maintenance out of your hard rock crushing. Rubbing, the main cause of premature jaw plate wear and costly downtime with conventional crushers is eliminated with Kue-Ken. By crushing without rubbing, Kue-Ken jaw plates are subjected to minimum abrasion and last at least 5 times longer. Consequently, power consumption is far less as it is not wasted wearing out jaw plates. With its mechanism operating in a sealed, dust-free crankcase lubricated by filtered oil, Kue-Ken crushes at higher speeds for greater capacity. This often permits using a smaller, lower cost crusher. An automatic flywheel release prevents breakage from tramp iron. On any hard rock job, Kue-Ken crushes at lowest cost per ton.

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KUE-KEN® CRUSHERS

"Crushing without Rubbing"

STRAUB MFG. CO., INC. 8381 Baldwin St., Oakland 21, Calif.

Jaw Crushers · Gyratory Crushers · Overhead Eccentric Crushers
Revolving Screens · Classifiers · Feeders · Rib Cone Ball Mills
Concentrating Tables · Vibrating Screens

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SALT LAKE CITY, UTAH . . . . . Lund Machinery Co.
SAN ANTONIO, TEX. . . . . Closner Equipment Co.
LOS ANGELES, CALIF. . . . . Garlinghouse, Freman Co.
SAN FRANCISCO, CALIF. . . . . Aggregate Engineers, Inc.
PORTLAND, OREGON . . . . . Air-Mac, Inc. of Oregon
BISMARCK, NORTH DAKOTA . . . . Midwest Equipment Co.
PHOENIX, ARIZ. . . . . Road Machinery Co.

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacture and Distributor, 323 S. Matlack St., West Chester, Penn.
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ALOYSIUS M. TULLO, vice-president and general manager of Worthington Corporation's Harrison (N. J.) Division, became a group vice-president of the corporation, effective January 1, replacing ELSTON J. TRIBBLE, who has resigned.

WILLIAM A. FINN, general manager of Worthington's Holyoke (Mass.) Division, will be promoted to general manager of the Harrison Division, succeeding Mr. Tullo. FREDERICK B. SEEL, manager of engineering at the Holyoke Division, will become general manager of the Holyoke Division.

Weston Dump Body Company, Des Moines, Iowa, has been appointed sales and service representative for the complete line of truck equipment manufactured by the Daybrook Hydraulic Division, Young Spring & Wire Corporation, Bowling Green, Ohio.

Announcement has been made of the appointment of THOMAS P. GRACE as sales representative for the Island of Manhattan for the Dodge Manufacturing Corporation, Mishawaka, Ind. Mr. Grace will work out of the New York district sales office, under the direction of James Kerr, district manager.

HOWARD F. VOIGT, has been appointed as the new president of the Stedman Foundry & Machine Company, Inc., Aurora, Ind., which is currently celebrating its 125th anniversary.

Mr. Voigt comes to Stedman, a subsidiary of the United Engineering and Foundry Company, Pittsgurgh, Pa., as a veteran of more than 20 years' service with the parent organization—most of it spent in Japan and the Far East.

Plans for the construction of additional manufacturing and office facilities at Danville, Ill., have been announced by the Hyster Company, Portland, Oreg.

The company's Danville Plant No. 2 will be enlarged by 115,000 sq. ft. to a total of approximately 225,000 sq. ft., according to James L. Woodley, plant manager. Preliminary construction work has started at the site, and completion is scheduled for October.

E. R. STERNBERG has been appointed chief engineer of the White Truck Division, The White Motor Company, Cleveland, Ohio. Mr. Sternberg was formerly chief engineer of the company's Autocar Division at Exton, Pa.

RALPH WARNER HARBISON, a member of the board of directors of the Harbison-Walker Refractories Company, Pittsburgh, Pa., died recently at the age of 83.

HENRY A. TOBEY has been elected vice-president in charge of manufacturing of the Bearing and Rock Bit Division of The Timken Roller Bearing Company, Canton, Ohio. He succeeds H. M. RICHEY, who retired.

WET BLAST HOLES?

switch to BEMIS EXPLOSIVES BAGS

With the trend to economical ammonium nitrate mixtures* for blasting, wet holes are a frequent problem.

But there is a complete and economical solution:

Bemis EXPLOSIVES Bags . . . made of three plies of creped wet-strength kraft for toughness . . . and Bemis-extruded, pinhole-free poly tubing for waterproofness.

You can drop them freely in holes up to 65 feet deep . . . 6 inches of water in the hole is a sufficient cushion. Leave them for a week before shooting . . . let 30 feet of water accumulate . . . it's all the same to Bemis EXPLOSIVES Bags.

Bag sealing? Takes only 6 or 7 seconds with a Bemis Tom Thumb Heat Sealer costing just $120.

Jagged holes? You may want to use the extra-protective Bemis burlap explosives bag with poly liner. It's a brute for punishment. And still economical.

Write or phone for complete information and a sample bag.

** Wide experience shows ammonium nitrate mixtures packed in Bemis EXPLOSIVES Bags reduce explosives costs by as much as 50 percent.*

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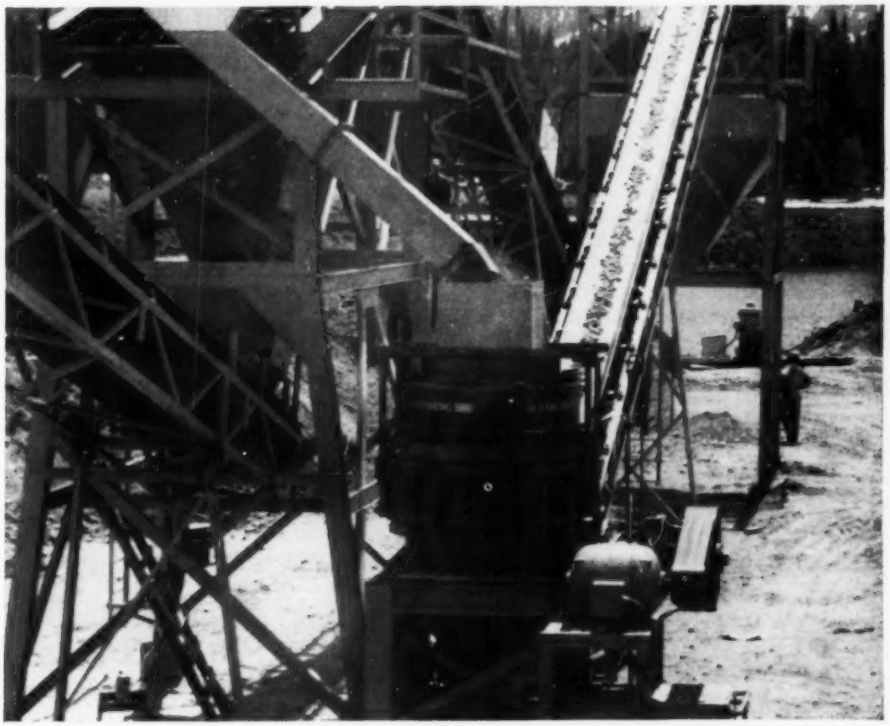
SYMONS® CONE CRUSHER AIDS WATER DIVERSION PROJECT



. . . produces over 100,000 tons of granite gravel with original crushing members

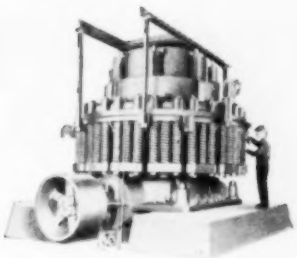
Shown "on location" in scenic Colorado, this 3-ft. Symons Standard Cone Crusher is doing an outstanding job of producing aggregate for a 23-mile long tunnel to divert some 500 million gpd of western slope water out of the Blue River to the eastern slope of the Continental Divide.

Operated by Blue River Constructors, in a crushing plant designed by Brown and Root, Inc. of Houston, this sturdy crusher has produced more than 100,000 tons of tough granite gravel, with the original crushing members.

This is another good example of the dependable performance that contractors and producers have learned to expect from Symons Cone Crushers, in both stationary and portable service.

Write for literature.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin



SYMONS® CONE CRUSHERS

. . . The machines that revolutionized crushing practice . . . are built in a wide range of sizes, for capacities to over 900 tons per hour. Write for descriptive literature.

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NORDBERG

SYMONS . . . a registered Nordberg trademark known throughout the world

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D. F.

Seabrook Machinery, Inc., Tallahassee, Fla., and Albany, Ga., has added Hydrocrane machines to the line of excavating and crane equipment that it distributes for the Bucyrus-Erie Company, South Milwaukee, Wis., in north central Florida and southwestern Georgia.

The firm now offers sales and service on the full line of Bucyrus-Erie convertible excavators and cranes; transit cranes; Hydrocrane lifting cranes; and the Hydrocrane excavator.

EDWARD J. GREEN has been elected vice-president—planning and marketing of the Westinghouse Air Brake Company, Pittsburgh, Pa. Mr. Green came to Pittsburgh in 1953 as executive assistant to the president of WABCO.

Fuller Manufacturing Company, Kalamazoo, Mich., has appointed FREDERICK K. STULL to the position of factory manager, succeeding MERLE PAYNE, who has retired.

Appointment of STEVEN L. ANDERSON to the post of western region market analyst at Los Angeles has been announced by officials of SKF Industries, Inc., Philadelphia, Pa. Mr. Anderson joined SKF in August, 1959, serving initially with the central marketing department.

ELLIS B. GARDNER has been appointed executive vice-president of Hewitt-Robins Incorporated, Stamford, Conn. Since 1955 Mr. Gardner has headed the company's Foam Products Division. Concurrently, PITT B. HARRIS was promoted from sales manager to acting general manager of the Foam Products Division.

The Cincinnati Steel Products Company, Cincinnati, Ohio, is a new distributor of the full line of Olin Aluminum mill products for the Metals Division of the Olin Mathieson Chemical Corporation, New York, N. Y. These products include aluminum sheet, plate, coil, rod, bar, extrusions, pipe, and tubing.

RICHARD E. GURLEY JR. has been appointed district sales manager in the Knoxville, Tenn., area for Dayton Industrial Products Company, Melrose Park, Ill., a division of The Dayton Rubber Company.

He will work under the supervision of Leo E. Miller, regional sales manager, Atlanta, Ga., handling sales of the company's line of industrial V-belt drives, hose, and extruded and molded rubber products in eastern and central Tennessee.

R. E. Gurley Jr.

R. T. Kelton

The appointment of RICHARD T. KELTON as its western regional sales manager was announced by Sutorbilt Corporation, Compton, Calif. In his new position, Mr. Kelton will supervise technical sales in the western portion of the United States.

Most recently a senior engineer in research and development for Raybestos-Manhattan, Inc., Manheim, Pa., Mr. Kelton was also a sales engineer with the Fuller Company, Catasauqua, Pa., for 7 years.

CHARLES S. WICKS has been named manager of the Chase Bag Company manufacturing plant in New Orleans, succeeding D. H. Denholm, who has resigned.

Mr. Wicks has been chief industrial engineer for Chase, heading the firm's Industrial Engineering Department in St. Louis with which he has been associated since 1953. He joined the Chase Bag Company in 1930 and has also been connected with its branches in Cleveland and Goshen, Ind.

FRANCIS W. HOLBROOK has been named executive engineer by the Western-Knapp Engineering Company, San Francisco, Calif. Mr. Holbrook will represent the engineering and construction firm from WKE's Chicago office.

MASTER MECHANICS CORNER:

Karl Wernle, Master Mechanic in charge of 250 machines for McDougal-Hartmann Co., Peoria, Illinois, working on Illinois Interstate Highway Rt. 74 at Peoria, Ill.

"Most bolts and nuts don't seem to hold our equipment together when the going's rough. We've found Cat bolts and nuts do."

Caterpillar Tractor Co., General Offices, Peoria, Ill., U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Enter 184 on card, page 169

Enter 185 on card, page 169 →

Cat DW21-PR21 units handle rock "on the double"

Increasing production is one of the soundest ways to cut quarry costs. Caterpillar DW21 Tractors with Athey PR21 Rear Dump Wagons were designed to help quarry operators do just that. Here's why:

They're big, rugged and an easy shovel target. They have a low center of gravity and are maneuverable.

The payoff of these features is in top production. For example, on the job pictured below, there were three Cat DW21-PR21s at work. The units were required to maneuver in limited room on benches and steep haul roads. Material included shot rock and sandstone. On haul lengths averaging 300 yards, the units handled 275 cu. yd. an hour.

DW21 Series G now 345 HP

Now the new DW21 Series G is matched to the 22.5 cu. yd. PR21 for even faster production on the toughest jobs. Compared with the model it replaced, it has new HP—345 (maximum output) for an increase of 8%. It also has 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, the horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics of the Cat Engine.

Get the complete facts on the Cat DW21-PR21 from your Caterpillar Dealer. Ask for a demonstration. Pick a tough job—see for yourself how this giant handles the hard work!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE ONLY COMPLETE TRACTOR-TRAILER LINE... BY THE LEADERS

LOAD FAST! PR21 offers a big target. Short non-stop turns of DW21-PR21 unit speed spotting under shovel and work on a narrow bench. PR21's special steel withstands impact, abrasion and corrosion.

ROLL FAST! Two of three DW21-PR21 units on the job. DW21 combines high travel speed with excellent torque characteristics. The PR21 has a 22.5 cu. yd. heaped and 62,000 lb. capacity. All this adds up to fast cycles, top production.

DUMP FAST! PR21 has hydraulic hoists for quick and complete dumping of any material. DW21's hydraulic steering facilitates maneuvering. Wide-section, tubeless tires provide maximum flotation and sure traction.

FRANK T. HOUSE has been appointed sales promotion manager and HERMANN A. BURKHARDT, publicity manager, for the Bucyrus-Erie Company, South Milwaukee, Wis.

Mr. House was recently transferred from the company's Atlanta office, where he had been a sales representative, to South Milwaukee as sales development manager, commercial cranes and excavators.

Mr. Burkhardt, with 20 years' experience in the company's advertising and publicity department, has handled a variety of assignments, including such positions as editor, advertising production manager, space buyer, and publications manager.

The McKay Company has begun a $500,000 expansion of its electrode plant at York, Pa. Additional manufacturing facilities and a new laboratory are expected to be completed by next April.

Hits like THOR'S hammer!
Cape An Alloy
FORGED
DROP BALL
It's a legend among modern quarry operators that no secondary rock-breaker can match the "Cape Ann" for efficient, economical performance.
Extra life and wearability are built *into* the "Cape Ann" Forged and Heat Treated Steel Drop Ball . . . extra durability and profits come *out* of it!
Every one is sonic tested before shipment, and fully guaranteed.
2,000 to 12,000 lbs.
CAPE ANN
ANCHOR & FORGE CO.
P.O. BOX 360
GLOUCESTER
MASS.
Enter 186 on card, page 169

D. Dodd

Announcement has been made of the appointment of DORACE DODD to the post of assistant manager, tractor division, southern district, for The Eimco Corporation, Salt Lake City, Utah.

Mr. Dodd joined Eimco in 1947 as a sales engineer trainee. In 1951 he became a sales engineer, and in 1956, senior sales engineer. He will continue to headquarter in Birmingham, Ala., where Eimco's southern district office is located.

PHILIP B. STULL has been elected president and chairman of the board of the American Enka Corporation. He succeeds William Gage Brady Jr., who has retired after serving as chairman since 1953 and as president since April, 1959.

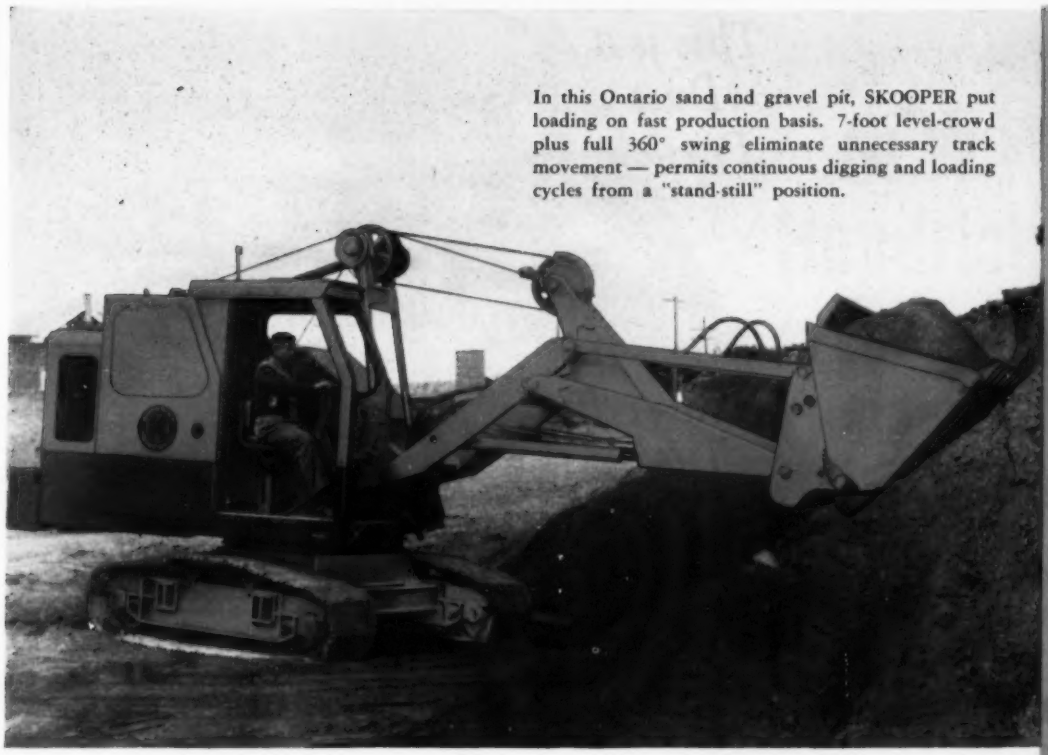
Mr. Stull was formerly a vice-president and director of Hercules Powder Company, Wilmington, Del. He has been a director and a member of the executive committee of American Enka since 1956.

C. H. GLASIER has been appointed executive vice-president of the Air Reduction Sales Company, New York, N. Y. Mr. Glasier has been associated with Airco since 1936 and most recently held the position of vice-president, gases.

The Jeffrey Manufacturing Company, Columbus, Ohio, has appointed PETER AMBROSIANI as manager of the western territory for the Mining Division. Mr. Ambrosiani will have offices at the E. C. Horne Machinery Co., Denver, Colo.

Harris-Euclid, Inc., Sioux Falls, S. D., has been appointed dealer for the Euclid Division of General Motors Corporation in South Dakota.

LAWRENCE LITCHFIELD JR., executive vice-president of Aluminum Company of America, Pittsburgh, Pa., has been elected a director.



In this Ontario sand and gravel pit, SKOOPER put loading on fast production basis. 7-foot level-crowd plus full 360° swing eliminate unnecessary track movement — permits continuous digging and loading cycles from a "stand-still" position.

KOEHRING SKOOPER

There's nothing like it—on wheels or Tracks!

SKOOPER combines big bucket capacity of front-end loaders . . . with the fast, smooth swing of an excavator turntable

Now you can do big bucket digging and loading *without* the usual drive-in back-out waste motion of tractor front-end loaders . . . *without* the high track or tire maintenance of a skid-turn operation. Follow Koehring SKOOPER through a typical dig-swing-dump-return cycle . . . check its *economy of motion:*

Powerful action of twin hydraulic rams crowds the 2-yard bucket along a smooth 7-foot level clean-up from "stand-still" position . . . or cuts any angle of bank slope. Next, SKOOPER swings . . . dumps load fast, clean from roll-over bucket . . . then swings back, starts next cycle . . . all *without traveling.* Or . . . at any time, SKOOPER can swing and travel simultaneously. Work with crawlers parallel to cut, or headed into bank. Has 3 types of interchangeable buckets (rock, re-handling, general purpose).

See for yourself

Check this revolutionary SKOOPER in action. Stop-watch its fast cycle time . . . see for yourself how many tons it moves per hour with only 64 H.P.! Also check its low maintenance cost, and unique advantage of excavator-crane convertibility. Call Koehring® distributor, or write.

Mail to: **KOEHRING DIVISION**
3026 W. Concordia, Milwaukee 16, Wis.

Send: ☐ bulletin ☐ specification sheet on SKOOPER

Name _____

Title _____

Company _____

Street _____

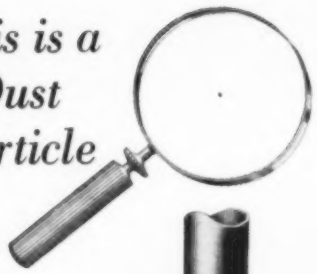
City, State _____

P&Q K57

KOEHRING HEAVY DUTY

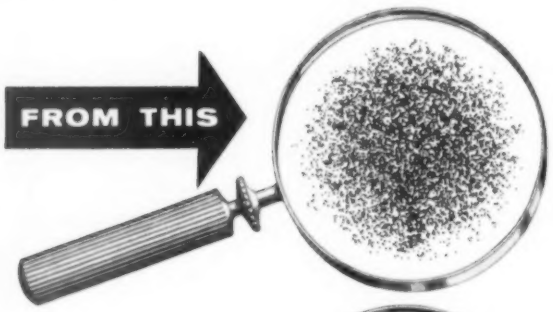
A Division of Koehring Co.

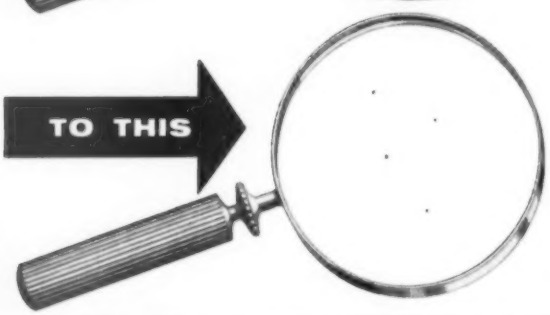
This is a Dust Particle



This is a Cyclo-trell Dust Collector →

The Cyclo-trell Dust Collector Cleans Gas with these Dust Particles...





Result: Efficiencies Exceeding 98%

This is a fact. If you have a process or cleaning problem in steel mills, refineries, paper, cement or chemical plants, call on Research-Cottrell. • We will be glad to consult with you on your specific dust collection problems, and place at your disposal the largest research and engineering facilities.

For further information, write for Bulletin 300 which describes several applications in detail.

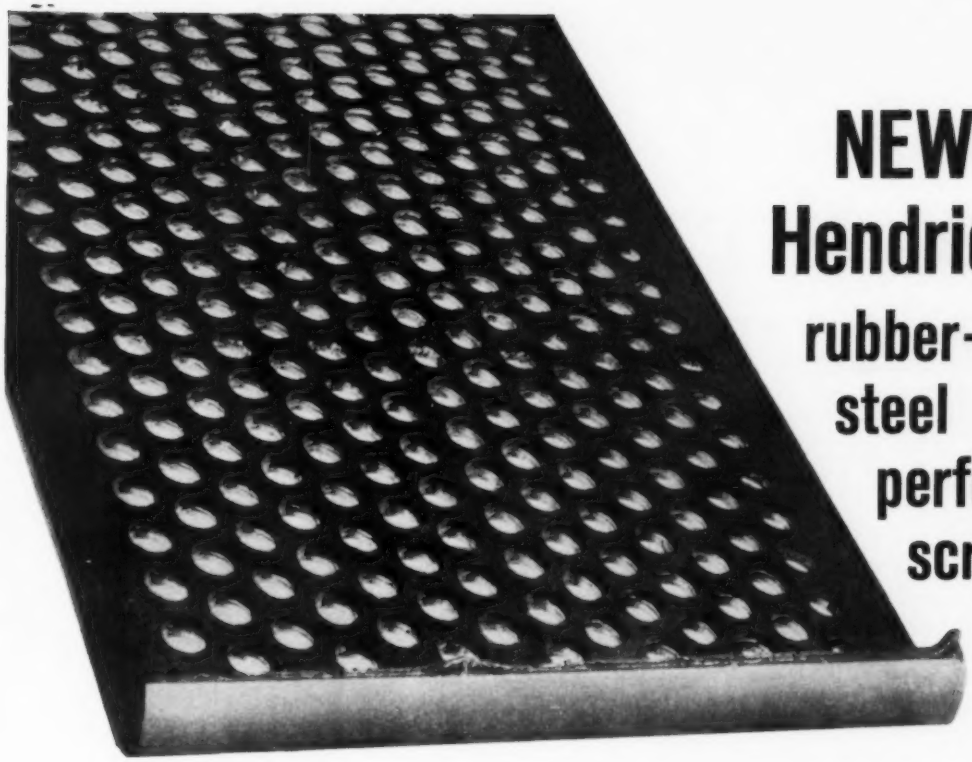
Research-Cottrell, Inc.

RESEARCH COTTRELL INC TRADE MARK

Main Office and Plant: Bound Brook, New Jersey

Representatives in major cities of U. S. and Canada

RC-205



NEW Hendrick rubber-clad steel perforated screen . . .

. . . the best way to beat abrasion!

this picture shows you why

The top layer of the Hendrick screen is made from the same kind of long-wearing rubber that is used in auto tire treads. This rubber blanket takes the brunt of the wear—outlasts conventional screening materials in the toughest service.

Between the two layers is a special adhesive that keeps them sealed tightly together for the life of the screen. The lower section is durable Hendrick Perforated Steel Plate bonded to the rubber by hydraulic pressure to assure a complete, lasting, lamination.

The joined sheet is steam-cured. Result? Extra durability, even in applications where extreme abrasive conditions usually cause screen wear.

Hendrick rubber-clad steel perforated plate is available in a wide range of thicknesses, so you can easily choose one to satisfy your individual screening application. Write today for complete information and sizes.

Rubber-Clad Steel Screens are Patented #2,861,326.

Hendrick

MANUFACTURING COMPANY

39 Dundaff Street, Carbondale, Pa.

Perforated Metal Screens • Wedge Wire Screens • Cascade Wedge Wire Screens • Wedge Slot Screens • Rubber Clad Perforated Screens
Flanged Lip Screens • Flights • Shaker and Conveyor Troughs

MIGHTY... HEALTHY... POWER

Whether your choice is the 225-hp HD-21 or the 150-hp HD-16, you get from 8½% to 27% more efficient engine operation than from other crawlers.

This fuel-pinching efficiency is a fact! Your Allis-Chalmers dealer will show you actual proof of up to 27% fuel savings in the Allis-Chalmers 16000 or 21000 engines over units of comparable size. He'll tell you why they run cleaner . . . how they "sip" fuel to earn the title "industry's healthiest engines."

Six crater-shaped pistons develop 225 hp in the HD-21, 150 hp in the HD-16 . . . both at an easy 1825 rpm. Coupled with torque converter drive, they provide plenty of rough dozing lugability . . . all the power you'll ever need.

These big Allis-Chalmers tractors are built for mighty tough service. Shock-absorbing all-steel main frame, durable double-reduction final drives, certified permanent lubrication of tapered roller bearing truck wheels, idlers and rollers, and extra tough track keep them going season after season with a minimum of maintenance. Your Allis-Chalmers construction machinery dealer will be glad to show you an HD-21 or HD-16 soon. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

move ahead with

ALLIS-CHALMERS

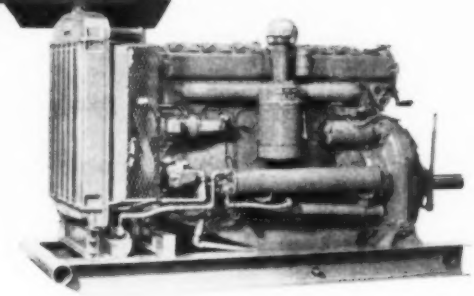
power for a growing world

Enter 190 on card, page 169

Two letters to remember in diesel engines and generator sets . . .

THE MP SERIES

MURPHY DIESELS



Here's the **MP** *Series Line-up*

MP SERIES ENGINES AND POWER UNITS—105 HP to 320 HP, 1200 and 1400 RPM.

MP SERIES DUAL FUEL ENGINES—also available.

MP SERIES GENERATOR SETS—60 KW to 188 KW.

MP SERIES MECH-ELEC UNITS for delivering mechanical or electrical power separately or simultaneously.

MP SERIES MARINE ENGINES AND AUXILIARIES—105 HP to 315 HP.

The 48-page booklet entitled "Before You Power a Job . . ." gives detailed information on MP Series Murphy Diesels. Ask your Murphy Diesel Dealer for a copy, or write direct. There's no obligation.

Deliver More Power Into the Job to Make More Profit for You

The power put into the job—not the power on the job, is the power that pays off for you. Engine reaction to load changes and speed changes determines the power that actually goes into the job. Only an engine with high rising torque can put more power into the job when needed.

MP Series Murphy Diesel engines are designed and built to deliver More Power into the job—the kind of *usable, hard-working power* you need. With high rising torque, they have the ability to take hold of a load and really hang on. This helps keep your equipment at the right operating speed for efficient production and More Profit. And remember, each day's production is determined by the *total power* put into the job that day.

To put MP Series Murphy power in your job, put Murphys on your job. You'll see the difference in your profits. Ask your Murphy Diesel Dealer for full information on the MP Series today.

MURPHY DIESEL

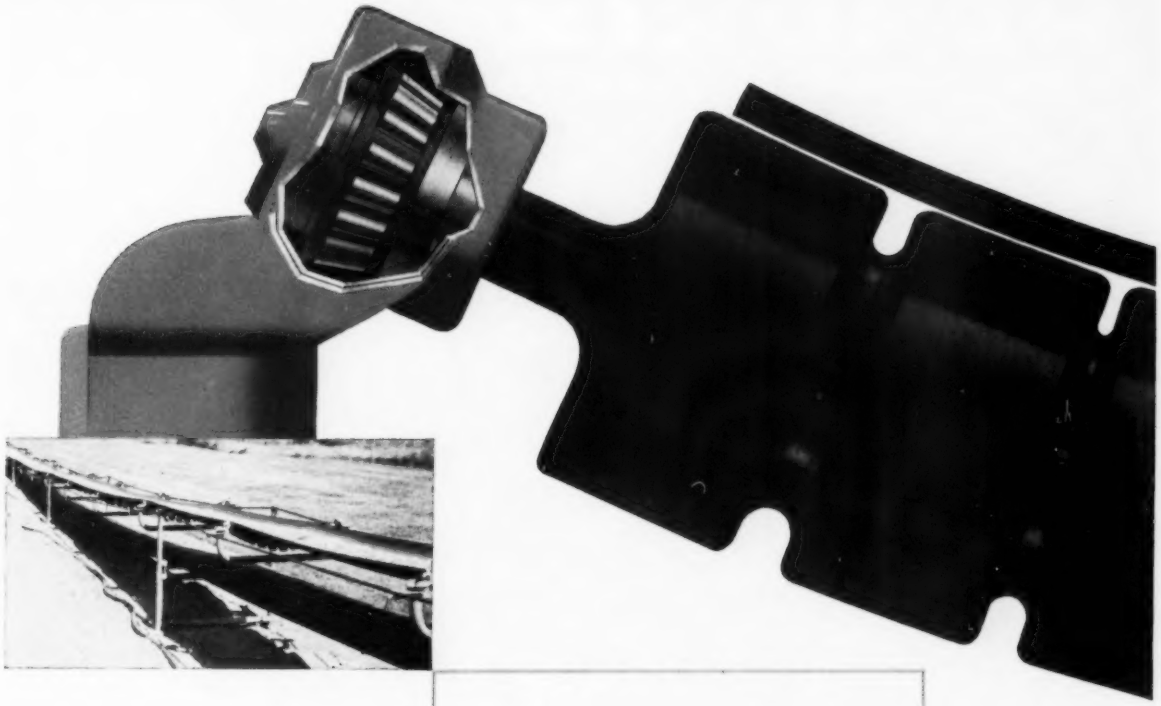
MURPHY DIESEL COMPANY

5307 W. BURNHAM ST., MILWAUKEE 19, WISCONSIN

433R

Sales, service and parts throughout the nation

Bearing Location is the Key to Long Service Life



JOY LIMBEROLLER® CONVEYOR IDLERS

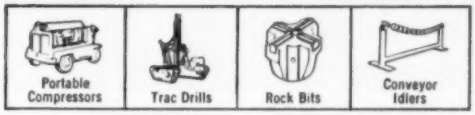
Joy Limberoller Conveyor Idlers give many times the normal service life, because the two bearings rest in slots in the support brackets—well away from spillage. On conveyor lines carrying sand, crushed rock, and other abrasive materials, Limberollers have given more than ten times the service life of steel idlers.

Limberoller Idlers consist of a neoprene coated wire rope to which are moulded neoprene discs. The ends of the rope turn in sealed bearings. This design not only eliminates clogging and freezing of the bearings, but also makes the idlers easy to service—they can be replaced while the belt is moving.

Limberollers are economical, not only because of long service life, but also because they can be spaced further apart than steel idlers. They are corrosion and flame resistant, self-cleaning, and eliminate the "bump" typical of steel idlers.

For complete details, write for Bulletin 342-26.

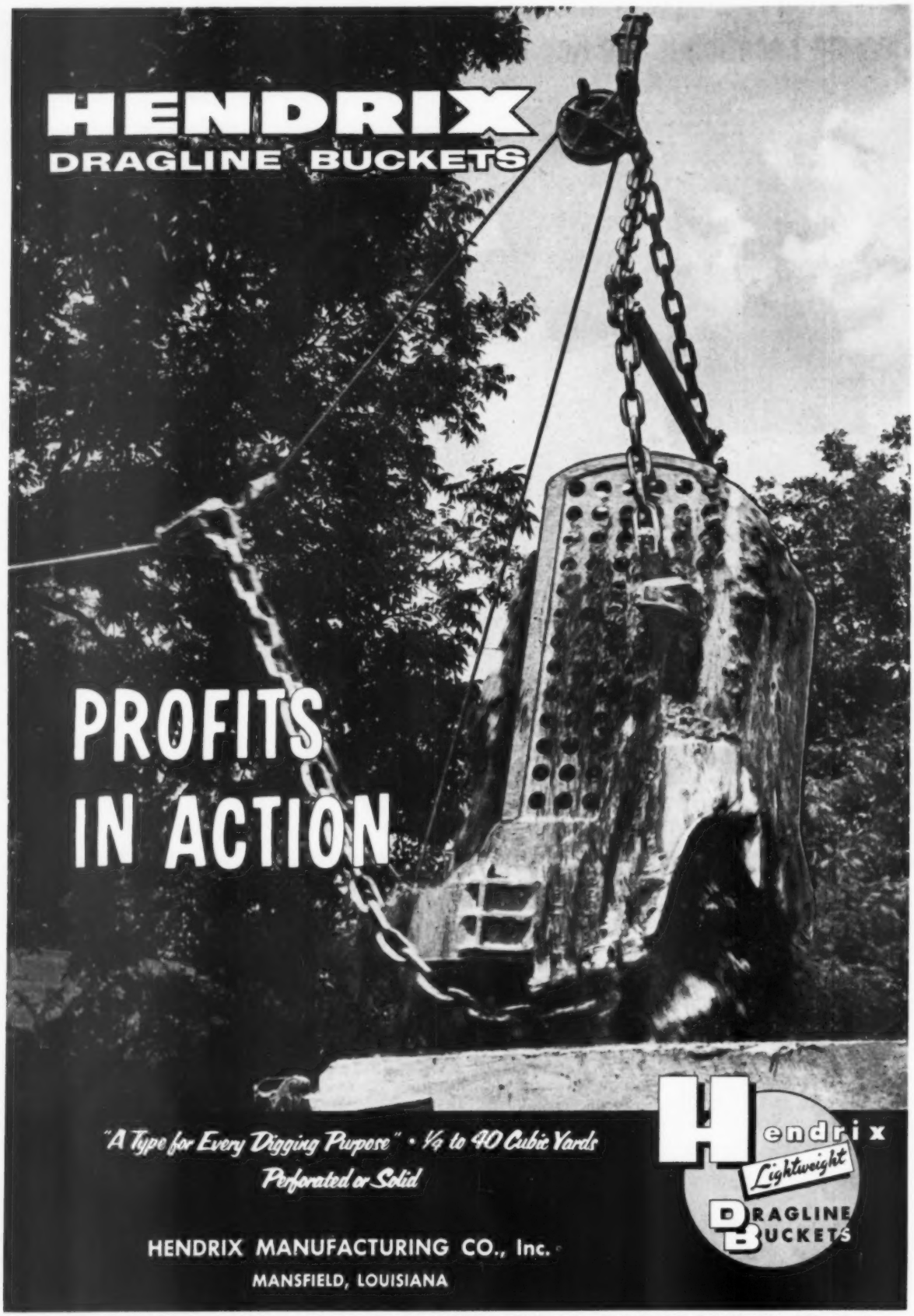
EQUIPMENT FOR QUARRYING . . . FOR ALL INDUSTRY



JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

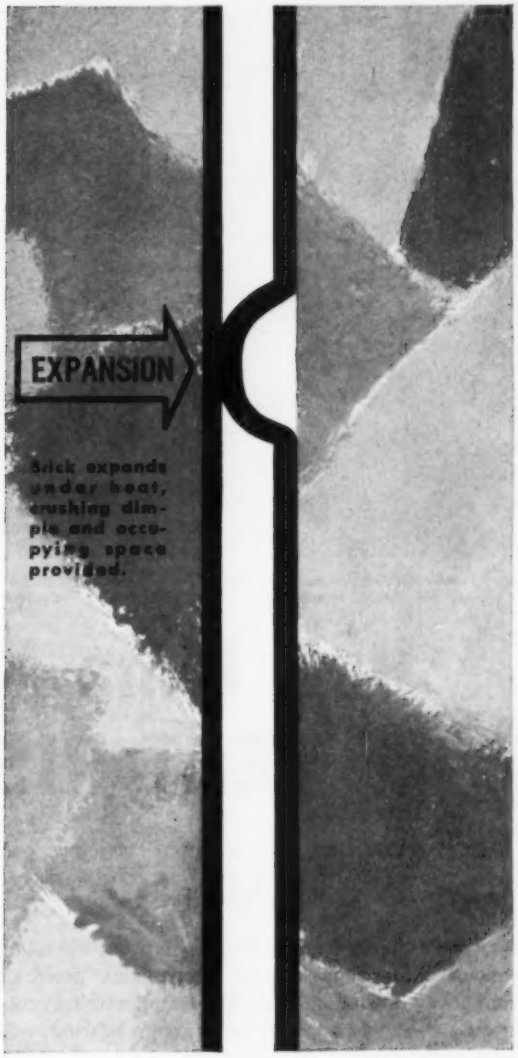


VISIT US AT THE NATIONAL SAND & GRAVEL SHOW, BOOTH 13, CHICAGO COLISEUM, FEB. 15-19

Porter Kilmag Brick

FOR ROTARY KILN LININGS:

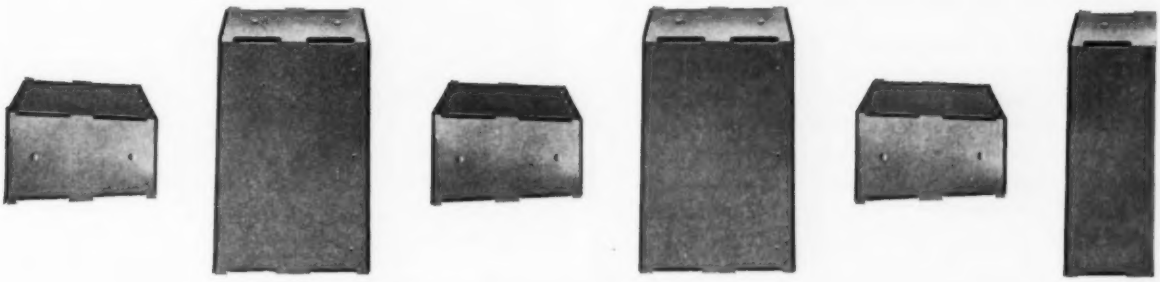
requires no "paper work"... dimpled steel spacers set up perfect expansion allowance



Porter Kilmag is a burned, magnesite-chrome brick with patented* "dimple" cladding . . . *an exclusive Porter feature!* Because of Kilmag's dimple cladding, you get these important mechanical advantages: (1) Kilmag requires no added labor, "paper shimming" or other field expedients to establish proper expansion. (2) Kilmag lays up faster. (3) Kilmag reduces labor costs. (4) Kilmag's expansion dimple is permanent *regardless* of storage conditions.

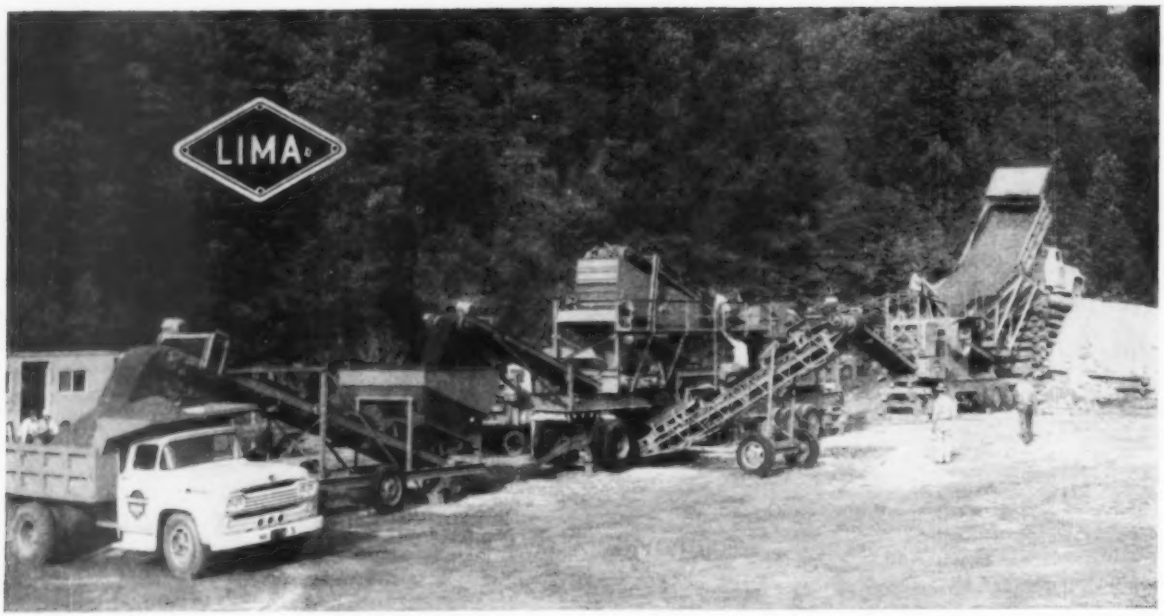
Kilmag's refractory qualities match its mechanical excellence. A dense, thoroughly burned structure provides uniform strength from cold to hot face, under stress. Kilmag has an exceptional ability to build and *hold* a clinker coating. Kilmag brick are available in 6" arches and 9" wedges. One shape turns a given diameter, plus a ⅔ and a ¾ brick for keying up.

For complete details on cost-saving, high efficiency Porter Kilmag, or *any* refractory application, write: *Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.* *Pat. Pending



REFRACTORIES DIVISION PORTER **H.K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION, PEERLESS ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S.A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.



Completely portable Lima A-W crushing installation has primary 20 by 36-in. jaw crusher, Model 101-CE secondary plant and 7-yd. surge bin. Delivers exceptionally high production for Maymead Lime Co. in Tennessee.

How Lima Austin-Westerns BEAT RISING COSTS!

Higher output, lower maintenance. These two cost reducers are characteristic of Lima Austin-Western Crushing, Screening and Washing equipment.

Advanced engineering design assures top operating efficiency for years—free of maintenance problems and costly downtime. Improved manufacturing processes and extensive use of anti-friction bearings and heat-treated alloy steels also add to the dependability of this rugged, precision-built machinery.

Lima A-W offers a complete crushing, screening and washing line including jaw and roll crushers, matching screens, conveyors and bins. Stop increasing costs; learn how Lima Austin-Western meets your exact needs for low-cost, accurately sized specification materials. See your nearby distributor or write to Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio.

Lima Austin-Westerns available for stationary or portable installation.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

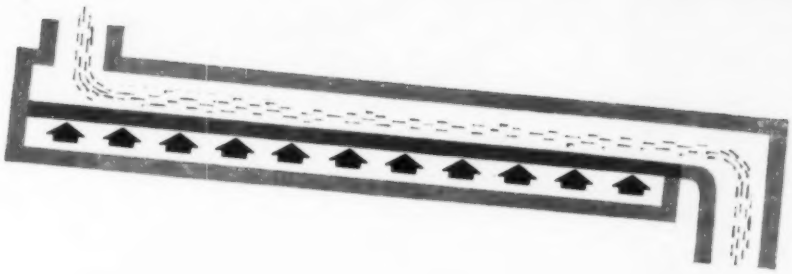
CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO

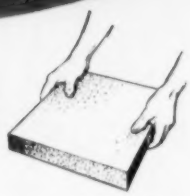
607

KENNEDY

AIR FLOAT

the better-built, more efficient air-gravity conveyor provides the answers to Dry Solids Conveying





The special porous plate is exclusive with KENNEDY AIR-FLOAT. It is strong, resistant to abrasion and temperature and has a smooth surface texture.

Sections are ruggedly designed, formed on modern production equipment and completely assembled before shipment.

Q. How does AIR-FLOAT work?

A. *The dry material to be conveyed is fed on to a smooth, rigid, porous plate through which low pressure air continuously diffuses. Because the conveyor is inclined about 6 to 8°, the aerated material flows by gravity.*

Q. What distinguishes the KENNEDY AIR-FLOAT from other air-gravity conveyors?

A. *Primarily, the special porous plate. Also the casing is of heavier construction, flanged and channeled for greater rigidity.*

Q. How is this special plate better than other porous media?

A. *The AIR-FLOAT porous plate has literally millions of tiny pores through which the air diffuses uniformly for thorough aeration of the conveyed material. The plate is thicker, stronger, temperature- and wear-resistant, and has a very smooth surface texture.*

Q. How does this improve conveying?

A. *AIR-FLOAT has a much higher capacity than competitive air-gravity conveyors. Blind spots are eliminated and the angle of inclination is less critical.*

Q. What about maintenance?

A. *The KENNEDY AIR-FLOAT is the nearest thing to a completely maintenance-free conveyor that has ever been devised.*

Q. Can turns be made?

A. *Direction changes up to 45° are made with standard pieces. These can be combined for greater angles.*

Q. Are accessories available?

A. *Yes. End and side discharge boxes, splitters, control gates, transitions, bin extractors and required blowers can be provided.*

Q. Have KENNEDY AIR-FLOAT Conveyors been fully tested and proven?

A. *Yes. For more than 12 years AIR-FLOAT Conveyors have been successfully used in KENNEDY-designed cement and lime plants. With this background of experience, KENNEDY is now making AIR-FLOAT available to industry, mass producing it to sell at competitive prices.*

For more information on AIR-FLOAT, ask for Bulletin 58-K.

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

Your new plant or expansion idea

Raw materials available?

Market available?

Location correct?

Capacity adequate?

Readily financed?

Right time to build?

Kaiser Engineers specializes in the design and construction of major facilities used throughout the Minerals industry, and has world-wide experience in design of such facilities.

Among KE's most valued services are sound, searching, economic analyses, feasibility studies and site and market evaluations. In a word—*Pre-Engineering*—impartial, outside analysis which helps you decide whether to proceed with, defer or modify the project.

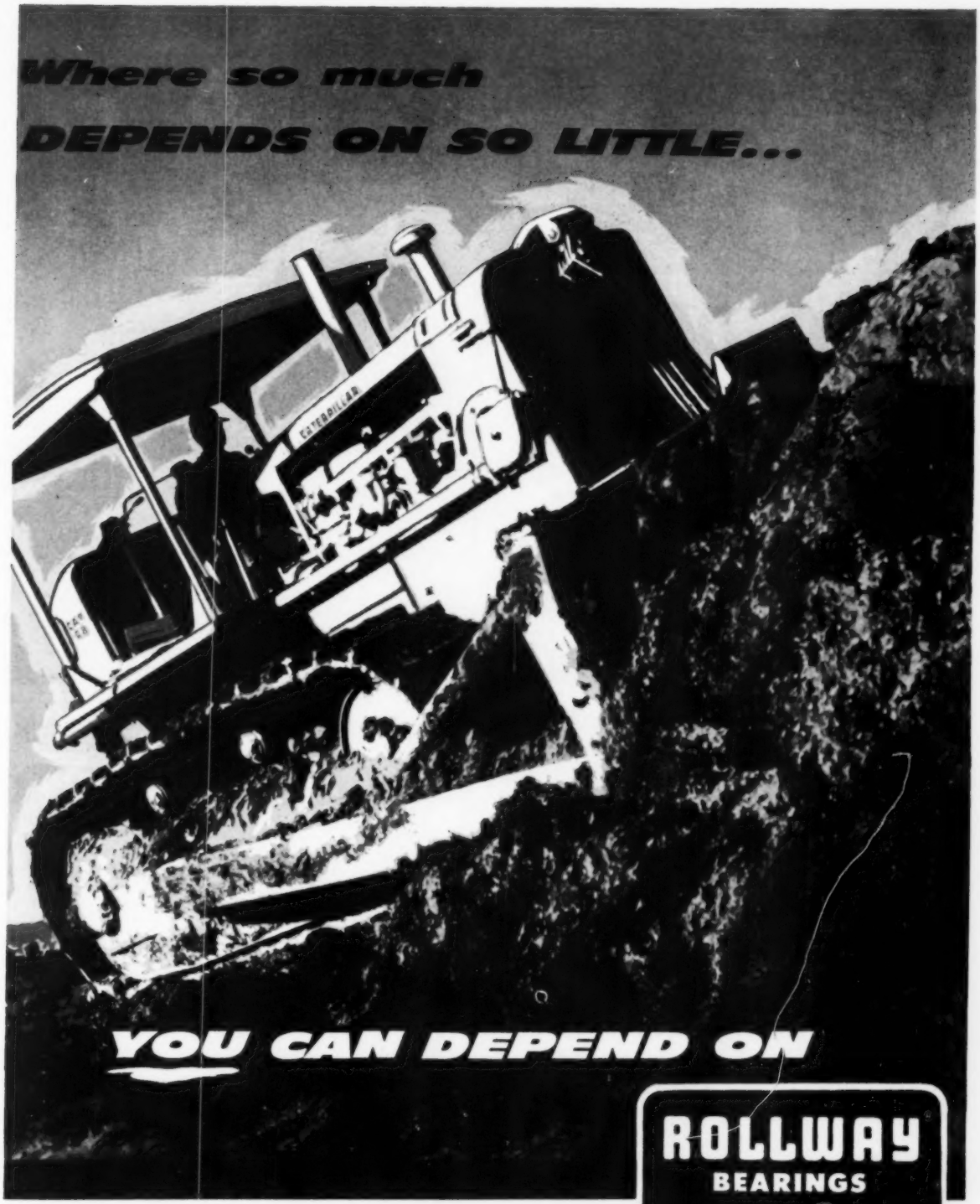
Kaiser Engineers offers you cost-saving, time-saving one-company service from concept through start-up.

KAISER ENGINEERS

Division of Henry J. Kaiser Company
Oakland 12, California
Pittsburgh, Washington, D. C., Chicago, New York

• KE projects include work in Australia, Brazil, Ghana, India, New Zealand, as well as Canada and the United States. Assignments include iron ore concentrating plants, cement plants, bauxite and alumina processing plants and diatomaceous earth facilities.

5469-M



The rugged Caterpillar crawler Tractor above is depended upon throughout the world to keep the big jobs moving. A single bearing failure can cause costly delays, perhaps endanger job completion in contract time. That's why Caterpillar and other well-known makers depend in many instances on Rollway bearings in vital spots! Rollway Bearing Company, Inc., Syracuse, N. Y., manufacturers of a complete line of radial thrust cylindrical roller bearings. Write for a complete product line catalog.

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DREDGE SLEEVE CLAMPS

Sturdy • Practical • Dependable • Economical

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U.S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply... positive in action. Write for illustrated folder, today.

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9th Ave. at 4th, Mendota, Illinois

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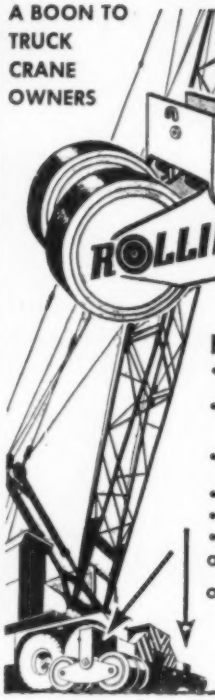
A BOON TO TRUCK CRANE OWNERS

INCREASE YOUR MOVING CAPACITY in both Short and Long Stick operations UP TO 50% with



ROLLING OUTRIGGERS
TRADE MARK PATENT PENDING

that FIT ALL MAKES AND MODELS OF TRUCK CRANES

- ALLOW NEAR-CAPACITY LOADS TO BE MOVED OVER LEVEL AND RUGGED TERRAIN
- ELIMINATE COSTLY, TIME-CONSUMING PRACTICE OF SETTING AND RE-SETTING OUTRIGGERS AND PADS
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- TANDEM, PIVOTAL ACTION WHEEL ASSEMBLY
- RUGGED CONSTRUCTION
- INSTALLED IN FIVE QUICK MINUTES

One Pair Single Tandem Units, Weight approx. 1360 lbs.

One Pair Double Tandem Units, Weight approx. 2630 lbs.

"ROLLING OUTRIGGERS" INSURE MOBILITY, SAFETY AND INCREASED PROFITS

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WRITE FOR NAME OF "ROLLING OUTRIGGERS" DEALER IN YOUR AREA

SOME EXCELLENT DEALERSHIPS ARE STILL AVAILABLE

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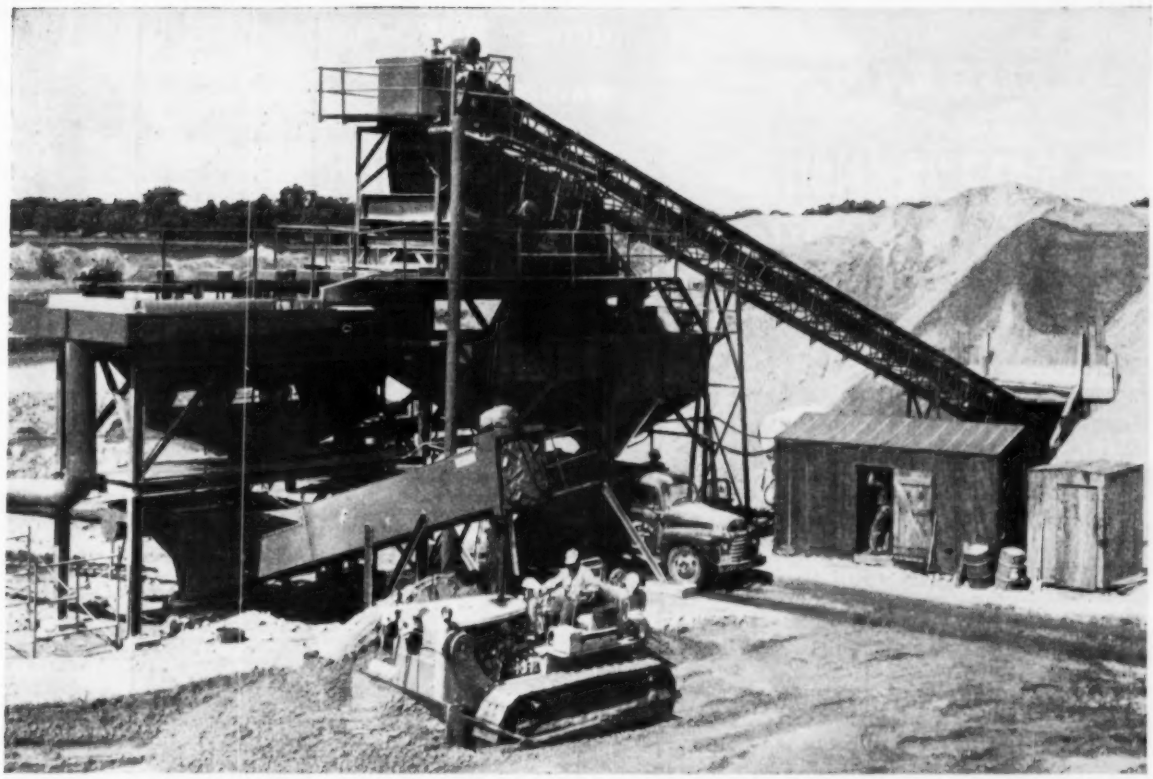


NEW Pioneer *Hydro-Screen* Washing Plants are easily adapted to changing pit conditions and product requirements. Unitized to be transportable in sections

Now...What's *your* aggregates washing problem?

● Whatever your problem, you may very well find that PIONEER has already designed and field-tested *your* answer . . . in one of its brand new family of *Hydro-Screen* Washing Plants!

Planned for growth as your business increases, there are many models to meet many needs . . . yet each is easily evolved from a simple basic design.

For example, Model 506-WT (shown above) has a 5′ x 12′ vibrating *Hydro-Screen*, a 10′ x 20′ Water Scalping Tank and a 36″ x 25′ Single Screw Classifier. It has a rated capacity of from 160 to 240 tph. Similar models with smaller or larger components for lesser or greater capacity are also available.

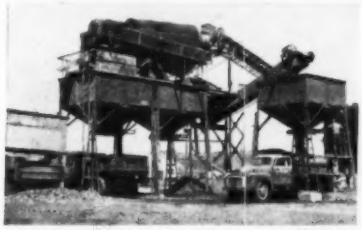
To meet other needs, there are other models, some without a Scalping Tank, others including a Revolving Scrubber. And, to any of these models you can easily add a Buzzer Screen for producing a fifth product, or Stockpiling Conveyors to augment or replace the bins.

What's more, any of these components can be added to a basic plant as your need arises. Not even structural members are wasted.

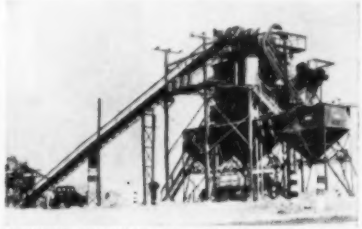
Unique new heart of these remarkably adaptable, all-electric Plants is the PIONEER *Hydro-Screen*, which cascades material through high-pressure water sprays to wash it specification-clean.

In fact, the *Hydro-Screen* combination of 1) *spray bars on all 3 decks*, 2) the *step-deck* design of the second deck, and 3) the *circle throw* of the inclined vibrating screen is so effective that screening capacity is 2½ to 3½ times greater than of a dry screen.

For all the facts on PIONEER *Hydro-Screen* Washing Plants, see your nearest PIONEER Distributor



PIONEER 306-W Washing Plant is an efficient semi-portable Plant with built-in scrubber, revolving screens, and screw classifier, complete and ready to go. Later, if you wish, you can add crushers, stockpiling conveyors, and other screening and sizing units. Rated capacity is from 50 to 75 tons per hour.



PIONEER 405-W Washing Plant has giant capacity in dirty materials. Can produce up to 2 different sizes of sand, 5 sizes of stone simultaneously . . . at production rates up to 200 tph. Secret of high capacity is big revolving scrubber working with inclined 4′ x 20′ tandem vibrating screen.

Free Handbook

For your free copy of *Facts And Figures* (the most complete and comprehensive handbook for the aggregates-producing industry), write to PIONEER ENGINEERING, Minneapolis 14, Minnesota, or contact your Pioneer Distributor.

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ELEVATOR DIVISION
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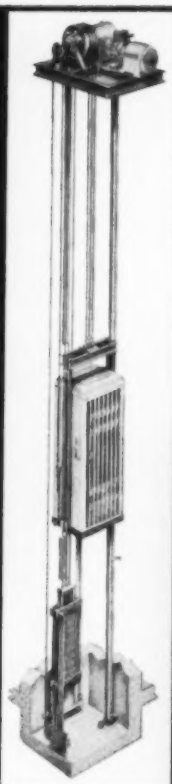

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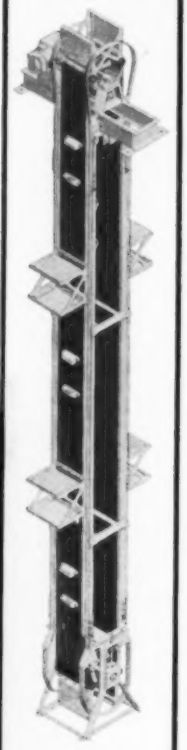
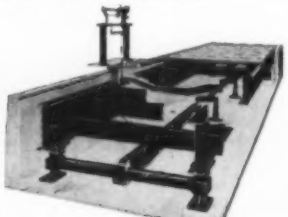


Winslow **TRUCK SCALES**
PIT AND PITLESS TYPES

CABINET DIAL
Weight indication available includes ball bearing poise weighbeams, direct reading and weight imprinting types, and dial equipment with or without weight printer.

Write or phone for more information
PHONE NORTH 1231

TYPE CS—PORTABLE—PITLESS
Type CS scales, pitless installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 50 tons. Platform sizes 18' x 9' thru 40' x 10', wood or steel deck.



TYPE S—PIT SCALE
Type S scales, pit installation, roller bearings, heavy duty, low maintenance. Capacities 15 tons thru 60 tons. Platform sizes 22' x 9' thru 60' x 10' for wood or concrete decks.

WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC.

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YOU CAN BUY OR SELL IT BETTER THAN ANYWHERE ELSE IN PIT & QUARRY'S

Broadcast Section

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Recommended for mines, quarries, construction work, storage yards — wherever belts length must be frequently changed. Hinged Plategrip Fasteners make a strong, flexible joint in heavy duty conveyor belts, trough naturally, ride smoothly over pulleys, yet can be separated by simply pulling the hinge pin. *Improved* design takes the new smaller diameter self-lubricating nylon sheathed cable hinge pins. No. 500X1 single bolt fasteners and No. 500X3 3 bolt fasteners (used at outside edges) to reinforce edges and aid troughing:

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Chicago, Illinois

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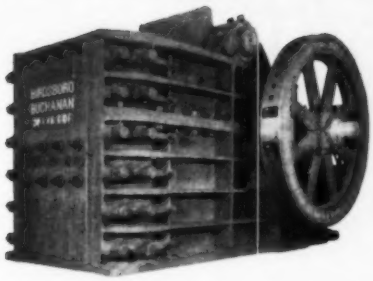
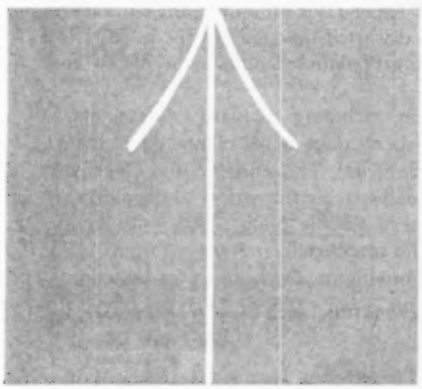
deep frame jaw crushers

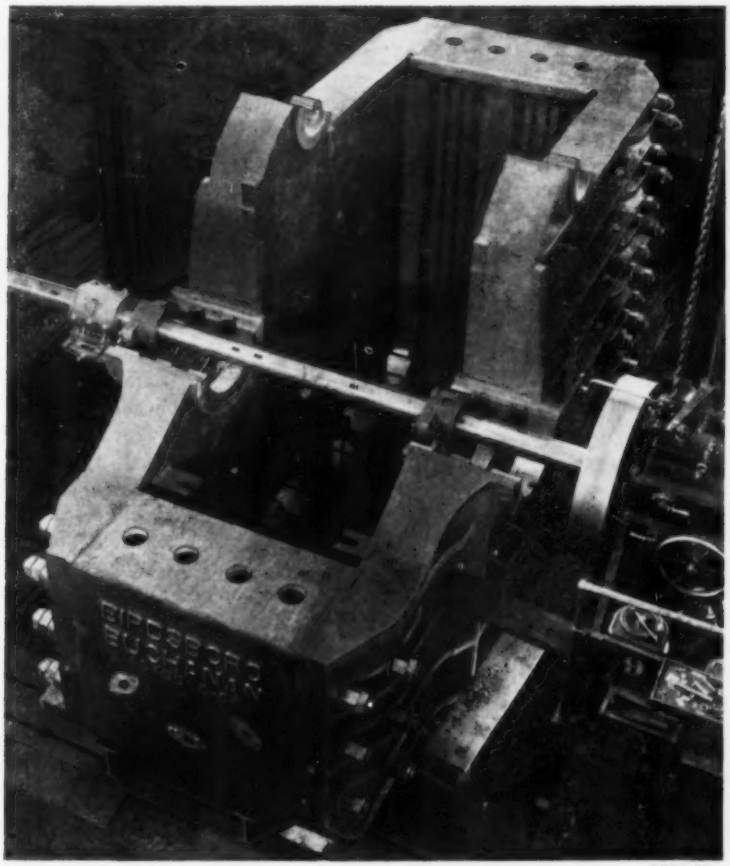
The BIRDSBORO-Buchanan Deep Frame design for Primary Jaw Crushers has long ago proven itself in production of profits. For example, the very first Buchanan crusher ever built *actually outlasted the plant it was used in.* All crushers are high quality electric steel castings thoroughly annealed. Precision machining of all joints to standard templates assures accurate fit. Extra depth through the front head provides great strength and rigidity. Your BIRDSBORO representative can show you many other construction benefits that pay off for you . . . both short range and long. *Sales Department, Engineering Department and Mfg. Plant.* Birdsboro, Pa., *District Office* · Pittsburgh, Pa.

Canadian Representative & Manufacturer: John Inglis Co., Ltd., Toronto, Canada.

World-Wide Agent Representation. Contact home office for nearest representative.







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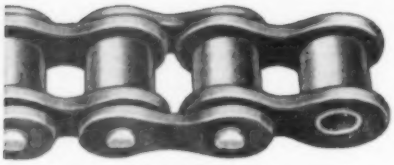
STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



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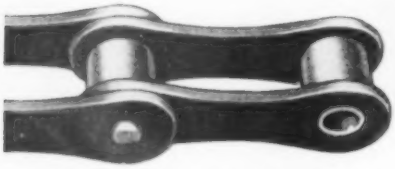
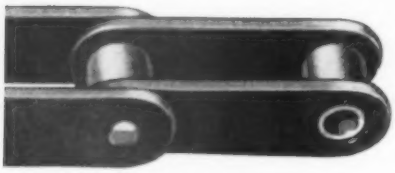
DOUBLE STRAND

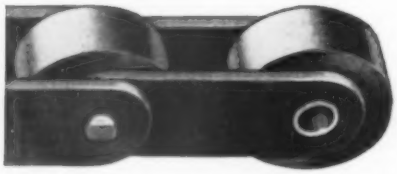
SINGLE STRAND, HEAVY SERIES



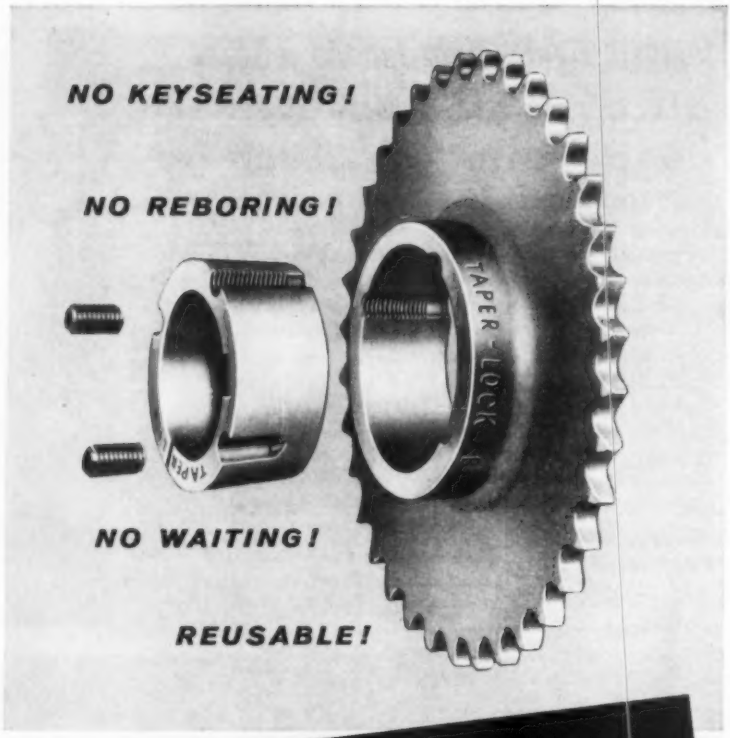
DOUBLE PITCH TRANSMISSION



DOUBLE PITCH CONVEYOR



DOUBLE PITCH CONVEYOR, LARGE ROLLERS



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DODGE ROLLER CHAIN

DODGE Quality Roller Chain, teamed with Dodge Taper-Lock Sprockets, results in chain drives and chain conveyors that have the precision, efficiency and stamina necessary for the real economy of *long life*.

Moreover, Taper-Lock's reusable bushing makes a difference in overall cost. The ease of Taper-Lock mounting, the elimination of reboring, keyseating, and wasted time, add to the saving. Precision machining and true articulation lengthen the life of *both* sprocket and chain.

The Dodge line of chain, including standard attachments, is extensive. It meets a high percentage of all chain requirements.

In the Double Pitch series (both Transmission and Conveyor) the sizes which require special spacing for perfect tooth action are offered from stock in special double pitch design — to double the life of the chain and the sprocket!

Ask your local Dodge Distributor. Or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 4000 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

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Require executive Resident Engineer with experience in OPERATION & CONSTRUCTION of cement plants. Sole responsibility for review of design, overall construction and start-up of 100,000 TON annual output plant.

Degree desired; knowledge of cement chemistry necessary. Salary commensurate with position, family transportation provided.

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Write stating age, education, experience, present employment and salary requirements. Replies strictly confidential.

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Established Block Plant in South Central Michigan

CLARENCE WARD
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Midwest sand plant. Steady work, good advancement for qualified man. List age, starting salary expected, detailed experience with cranes, shovels, crushers; drilling, welding, drying-blending-classifying methods, etc. Replies confidential.

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Plant Superintendent experienced in all phases of sand and gravel processing.

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Plant Manager—Age 47, 25 years experience in all phases of crushed stone production. Specification Stone, Mineral Filler. Ready Mix Concrete Operations. Resumé on request.

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OPERATING EXECUTIVE

A medium sized Midwestern crushing, rock, and gravel equipment, mining equipment and gray iron castings company is in need of a capable, middle aged or older operating executive. This opening has been occasioned by the recent death of one of its executives.

Company is 62 years old and during the past 10 years has been in the process of adding to, and building up its lines of manufacturing along with many improvements in plant and equipment.

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Chemical, Mechanical, and Electrical Engineers and Chemists. Ages 25—35 preferred. Responsible duties leading to managerial positions with multi-plant cement company. Give education, background, and salary expected. Replies confidential.

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1—Traylor 11' x 185' Rotary Kiln, 2 tires, welded, 7/8" shell.
1—Fennemberg 6' x 60' Rotary Kiln.
2—Abbe 5' x 16' Ball Mills.
3—Bucket Elevators; 125', 32', 30'.
2—Aurora 24" Vert. Cent. Pumps, 200 HP motors, 5000 gpm, 125' head.
1—Bemis Automatic Bag Packer, Sewing Machine, Conveyor and Fastener.
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1—8' x 8' Oliver Precoat Filter.
6—Dorr Thickener Mechanisms, 16'.
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2—20 ton Overhead Cranes, 30' & 35' spans.
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Up-to-date portable Rock Crusher, with two Northwest Diesel Shovels, and all necessary accessories. Cap. 200 tons per hour. Five different locations around Kansas City. Present owner operated this territory for 16 years at a big profit and wants to retire on account of his age. Will stand strictest inspection. Business and equipment priced below present machinery appraisal. Present experienced crew & Supt. available. $20,000.00 cash, balance terms.

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To represent large U. S. corporation in the construction and operation of cement plants in foreign locations.
Must have had at least 5 years experience in cement operations and pratices, preferably in the manufacture of Portland blast furnace slag cement.
Should have an engineering degree or equivalent experience.
Excellent salary and other liberal benefits available.
All replies will be held in strict confidence.
Please send complete resume of experience and qualifications to:

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Multi plant cement company needs engineer. Opportunity for training and advancement. Give full details on background. Replies confidential.

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3—10 x 78 Dryers with 200 HP Motors
4—¾ Symons Std. with coarse bowl
30" Merrick Weightometer
30" Merrick Weightometer

Stanley B. Troyer Equip. Co.
Box 97, Crosby, Minnesota

For Sale

2—Rotary dryers, 6' x 36', ½" material
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1—Link Belt roto louver dryer, Model 1008-30

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Farrell-Bacon Jaw Crusher 24" x 13" x 14" (No. 14) $1,500.00
2½" Reliance Jaw Crusher 15" x 30", No. 4755, with International Diesel Engine Mounted on Open Flatbed Trailer $3,500.00

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CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2 7/16" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

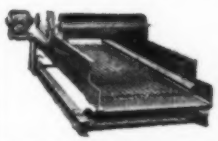
Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1397	$ 738	
14"	50'	2222	1159	$16.84
14"	85'	3377	1748	
16"	20'	1262	667	
16"	45'	2137	1118	18.04
16"	60'	2662	1388	
16"	90'	3712	1930	
18"	25'	1477	797	
18"	45'	2217	1182	
18"	70'	3142	1663	19.24
18"	85'	3697	1952	
18"	100'	4252	2240	
18"	130'	5362	2817	
20"	25'	1517	835	
20"	60'	2882	1548	20.37
20"	75'	3467	1854	
20"	90'	4052	2159	
24"	25'	1590	898	
24"	45'	2430	1334	
24"	70'	3480	1878	21.78
24"	100'	4740	2532	
24"	120'	5580	2967	
24"	150'	6840	3621	
30"	50'	2911	1617	
30"	70'	3871	2112	24.75
30"	90'	4831	2607	
36"	25'	1818	1118	
36"	45'	2858	1677	27.95
36"	60'	3638	2096	
36"	100'	5718	3214	

BONDED® HEAVY DUTY MOBILE CONVEYORS

- FAST ECONOMICAL HANDLING OF BULK MATERIAL
- AVAILABLE WITH SCREEN AND FEEDER
- RUGGED 30" DEEP TRUSS FRAME
- HIGH TONNAGE AT LOW COST
- EQUIPPED WITH TOW HITCH

The economical solution to the need for a heavy duty conveyor that can be readily moved from one job-site to another. Available with mast or mastless type undercarriage and hydraulic powered mechanism. All standard conveyor accessories can be used. Lengths to 60 feet and belt widths through 30 inches. **Priced from $2365.00**

BONDED® GENERAL DUTY AND HEAVY DUTY VIBRATING SCREENS



More than 7000 Mines and Quarries have modernized with Bonded Equipment

PERFECT BALANCE AND SHARP ACTION. Eccentric weight mechanism, spring mounted. 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULLETIN NO. 1086.**

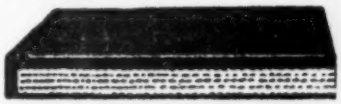
Model Number	Screening Area	No. of Decks	Sale Price
124A	2'x4'	1	$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	688
336A	3'x6'	3	956
138A	3'x8'	1	675
238A	3'x8'	2	815
338A	3'x8'	3	996

FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft; 3' x 6' to 5' x 14'. 1 to 5 decks. **WRITE FOR BULLETIN NO. 1087 AND 9 REASONS WHY BONDED IS YOUR BEST BUY.**

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	$1620
436B	3'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	4'x8'	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2400
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

TESTED CONVEYOR BELTING*

We pay freight on 200 pounds or over plus an additional 10% savings from sale price for full rolls 500 to 650 feet.



Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price Per Foot	Sale Price Per Foot
14"	4	$3.78	$2.94
16"	4	4.24	3.09
18"	4	4.69	3.42
20"	4	5.17	3.95
24"	4	6.08	4.43
30"	4	7.47	5.42
36"	4	8.85	6.43

Major Bee Brand: 16# to 19# Average Friction Pull, 2400# to 3000# Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

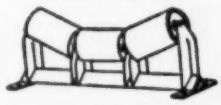
Width	Ply	List Price Per Foot	Sale Price Per Foot
14"	4	$4.48	$3.18
16"	4	5.04	3.60
18"	4	5.61	3.98
20"	4	6.14	4.54
24"	4	7.22	5.14
30"	4	8.87	6.31
36"	4	10.49	7.84
24"	5	8.47	6.07

***All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1234

BONDED® IDLERS & RETURN ROLLS FOR UTMOST ECONOMY ON THE JOB



3-roll, 5" diameter Troughing Idlers for:

14" belt	$19.75	24" belt	$22.75
16" belt	20.50	30" belt	23.85
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50

1-roll, 5" diameter Return Rolls for:

14" belt	$ 8.50	24" belt	$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1136.**

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — **WRITE FOR FREE CATALOG AND PRICES** — **PHONE Evenings: AX. 1-2213**

110 BELLEVUE Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers, Feeders & Bucket Elevators **COLUMBUS 7, OHIO**

QUARRY EQUIPMENT

Cedarapids Jr. tandem crushing plant, 1036 jaw.
Cedarapids 6C, 1236 twin jaw portable secondary.
Cedarapids 1236 twin jaw crusher.
Cedarapids 1216 twin jaw crusher.
Cedarapids 1036 jaw crusher. Reconditioned.
2—Cedarapids 4033 hammermills. Rebuilt.
Cedarapids 2033 hammermill. Slightly used.
Cedarapids 4' x 14' 2-deck screen. New warranty.
2—Cedarapids 4'x12' 3-deck screens. Rebuilt.
Cedarapids 4' x 12' 3-deck screen. New warranty.
Robins 4' x 9' triple deck screen.
Pioneer 4' x 8' double deck screen. Rebuilt.
Telsmith 3' x 8', 3-deck inclined screen.
Aggregates 4' x 14', 3-deck inclined screen.
54" dia. x 23' lg. revolving screen.
4' x 6'6" heavy duty reciprocating feeder.
2—Cedarapids 42"x10' apron feeders.
Cedarapids 30-S, 3-compartment charging hopper, apron feeder, bucket elevator. New.
Eagle 26"x20' double dog washer. Good.
McLanahan & Stone 8"x30' double log washer.
8'x12', 8'x18', 13'x23' bins in stock.
18", 24", 30", 36" conveyors & belting.

SHOVELS AND CRANES

Lorain L-50J, 1-yd. diesel crane-shovel-hoe.
Lorain L-26, ¾-yd. diesel dragline. Excellent.
Lorain TL-25, ¾-yd. diesel backhoe.
Lima 34 Paymaster ¾-yd. diesel shovel. Good.
Unit 1020 ¾-yd. diesel powered shovel.
Koehring 304, ¾ yd. diesel shovel-backhoe.
Northwest 25, ⅝-yd. Gas shovel.
Insley K-12, ½-yd. gas backhoe
Bucyrus-Erie 10B, ⅝-yd. gas shovel.
Byers 83-CC, 20-ton truck crane
Lorain MC-414, 20-ton Moto-Crane. Reconditioned.
Link Belt HC-50, 25-ton truck crane.
Michigan TLiFT-20, 10-ton truck crane.
Lorain MC-254, 15-ton moto-crane.
Lorain TL-20, 10-ton moto-crane.

TRUCKS, TRACTORS, SCRAPERS

2—Euclid 13-yd. bottom dumps. Good.
2—Euclid 27FD, 15-ton rear dumps.
1—Euclid tractor with 3200 gallon water tank
1—Caterpillar D-8 with cable angle dozer.
1—Caterpillar D-8 with push block.
1—Caterpillar D-7 with bulldozer, crane boom.
1—Caterpillar D-7 with hydraulic angledozer.
1—Caterpillar D-4 tractor only.
1—Euclid TC-12, twin engine tractor
1—International TD-24 with cable angledozer.
1—International 300 with loader, backhoe.
1—Letourneau Super C Turnadozer. Excellent.
1—Allis-Chalmers HD9-G tractor with loader
2—Allis Chalmers TS-360, 15-yd. scrapers.
2—Euclid TS-24, 24-yd. twin engine scrapers.
2—Euclid TS-18, 18-yd. twin engine scrapers
3—Euclid 18-yd. overhung engine scrapers.
1—Euclid 15½-yd. six wheel scraper.
2—Euclid 12-yd. overhung engine scrapers.
3—Euclid 7-yd. overhung engine scrapers
1—Caterpillar 80 tractor-drawn scraper.
Inquire for list of Drilling Equipment, Air Compressors, Diesel Power Units, Generators, Shovel & Backhoe Attachments.

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Camp Hill, Pa.
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1—4¼' SYMONS STD. CONE CRUSHER COMPLETE WITH "V" BELT PULLEY AND COARSE BOWL. NEW MARCH 1959. IN EXCELLENT CONDITION. SERIAL #40651.

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Wanted—A good used 3 or 3½ ft. short-head Cone Crusher for reducing 1¼" size Quartzite to Silica Sand. Union Mining Co., 2306 First Natl. Bank Bldg., Pgh. 22, Pa.

Sturtevant #1 Ring Roll Mill
Sturtevant #1 Rotary Fine Crusher
Acme #9A, 9x20 Jaw Crusher
Williams #230 Hammer Mill

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Exide Industrial Batteries

Twenty two batteries, type T.B. 29, two volt, size of battery case 14½" x 15" x 20" high. Weight of battery 415 pounds. Condition excellent.

Progress Iron & Steel Co.
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DRAGLINE OPERATORS

Experienced Electric B.E. 110 and 110B Special Dragline Operators. Year round work at one location. Good rate and fringe benefits. Write

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EUCLIDS

Rear, Bottom and Scrapers

15W Bucyrus-Erie Dragline, 14 yd.
9W Bucyrus-Erie Dragline, 9 yd.
7W Bucyrus-Erie Dragline, 7 yd.
200W Bucyrus-Erie Dragline, 6 yd.
5W Bucyrus-Erie Dragline, 5 yd.
7400 Marion Walking Dragline, 9 yd.
8½ yd. Bucyrus-Erie Shovel
950B Bucyrus-Erie H. L. Shovel
170B Bucyrus-Erie Shovel, 6½ yd.
120B Bucyrus-Erie Dragline, 5 yd.
120B Bucyrus-Erie Dragline, 4 yd.
88B Bucyrus-Erie Shovel and Drag.
54B Bucyrus-Erie Shovel and Drag.
2½ yd. Northwest Shovel and Drag.
95 Northwest Dragline, 2½ yd.
1½ yd. Marion Shovel
111M Marion Dragline, 4 yd.
111M Marion Shovel, 4 yd.
4121 Marion Shovel, 4 yd.
4161 Marion Shovel and Drag, 5 yd.
151M Marion Shovel, 6½ yd.
151M Marion Dragline, 5 yd.
7400 Marion Dragline, 10 yd.
5480 Marion H. L. Shovel, 18 yd.
1½ yd. Lima Shovel
3 yd. Lima Dragline
4 yd. Lima Shovel & Drag.
2400 Lima Drag., 5 yd.
2½ yd. Manitowoc Dragline
5 yd. Manitowoc Shovel
5 yd. Manitowoc Dragline
3000 Manitowoc Crane
3900 Manitowoc Crane
2½ yd. P&H Shovel
1055 P&H Shovel and Drag.
1500 P&H Shovel, 5 yd.
1600 P&H Shovel, 6½ yd.
ROTARY DRILLS—Truck Mounted and Crawler Mounted
McCarthy & Compton Coal Auger Drills
DOZERS—LOADERS—TRUCK CRANES
"Other equipment available not listed above."

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. Hazleton, Pa.
Gladstone 5-4041 - 5-0253

GRUENDLER 2436 Jaw Semi-Portable Plant with 14' apron feeder, conveyor, 125 hp. electric motor, all on steel skids. Excellent. $15,500 Lawton, Okla.
CEDARAPIDS 2225 Jaw Semi-Portable Plant with 8' apron feeder, conveyor, 40 hp. electric motor, on steel skids, excellent. $7750 Lawton, Okla.
CEDARAPIDS 2A Portable Plants w/1624 Rolls, 3x10 2-deck screen, rotovator, power, two folding type delivery conveyors, tandem rubber. Apparently unused. 60% off new price. $11,500 Fayetteville, N.C. Also slightly used units available Kansas City yard $10,500.
CEDARAPIDS Pitmaster Portable Plant w/1016 jaw, feeder, 1616 rolls, 3x8 screen, rotovator, power, rubber, good. $11,500.
PIONEER 3042 Jaw Dies, new. $450 each. Yard.
PIONEER 305W Washing Plant, w/7x24 scrubber-screen, bins, conveyor, power, good. $8500 Cloverport, Kentucky.
APRON FEEDER: 4'x18', excellent. $3000.
SCREENS: Cedarapids 4x12 3-deck horizontal, excellent. $2750. Telsmith 3x10 2-deck rebuilt. $1250. Deister 3x8 2-deck w/motor, excellent. $1250.
INGERSOL RAND 600 CFM Rotary Portable Diesel Compressor, overhauled, good. $7500. Rent $700/mo. apply purchase.
GARDNER DENVER WBK402 Compressor, rebuilt. $2750 Yard.
DAVEY 210 CFM Super Chief Portable Diesel Compressor rebuilt, late model. $1950 Yard.
ROCK BITS SAVE 75%. New Ingersol Rand, Types 1 & 2, side hole & center hole 2". Price 20c each.
SHOVEL FRONTS for P&H 655B, new, complete w/deck machinery. $4500. Lima 34 Paymaster, new. $1250. Unit 1020, new. $1250. P&H 255A, complete w/deck machinery. $1350.
LORAIN L41 Shovel, #19864, w/Cat. D318 diesel, good. $5500 Yard.

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Feel like a new man . . .

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Lancaster "Iriquois" Pug Mills
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New Universal Screens in stock
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F-55 Syntron Feeder Grizzly Type
Selenium Rectifier Controls

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North Bennington, Vermont

BEST BELT BUYS

Heavy duty quality, 2500-3000# cover tensile, 16-19# friction pull. Brand new, factory fresh, 3 weeks delivery.

4 ply 28 oz.		LIST	SELL
14"	1/8"x1/16"	$4.31	$2.42
16"	1/8"x1/16"	$4.86	$2.72
18"	1/8"x1/16"	$5.40	$3.02
18"	1/8"x1/16"	$5.69	$3.19
20"	1/8"x1/16"	$5.90	$3.32
24"	1/8"x1/16"	$6.95	$3.90
24"	1/8"x1/16" (5 ply)	$8.54	$4.78
4 ply 32 oz.			
24"	1/8"x1/16"	$7.79	$4.36
30"	1/8"x1/16"	$9.58	$5.36

Many other sizes. Samples on request.
Distributorships available.

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FOR SALE OR RENT

2—LORAIN 20-ton Wagon Cranes, Mdl. SP-414, Serial #20763 and #15193. 12-wheel tandem drive. 11:00 x 20 tires. 60' pin type booms. Rated 20 ton @ 10' rad. with 30' boom. Located in Philadelphia Plant.

Completely rebuilt and covered by E.C.A. Certificate of Warranty.

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1—13" x 30" Type B Farrel-Bacon Crusher
1—#1030 Good Roads Portable Crushing Plant—96 H.P. Diesel Engine, Screen & Elevator
1—Magnetic Pulley—Dings—30" dia. x 32" C.F. with motor & generator
1—Apron Feeder 36" x 16'-0"
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1—Link-Belt 3' x 5' Foundry Shakeout Screen—New
1—Syntron F-200 Vibrator
1—Link-Belt Slope Hoist, 48" x 48" Drum, Roller Bearings, Gear Reducer
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1—24" x 14" Allis-Chalmers Type B Crushing Rolls
1—3' x 8" Hardinge Rod Mill with Spare Liners
1—36" x 20' Revolving Screen
1—36" x 11' Revolving Screen
1—30" x 14' Revolving Screen
New All-Steel & Manganese J. & H. Hammermills 5½" x 18"
1—8' x 18' Hardinge Conical Ball Mill—New Gear

We build open and totally enclosed bucket elevators and belt conveyors to suit your needs.
Large stock chain, sprockets, buckets and conveyor pulleys—new and used.

JOHNSON & HOEHLER, INC.
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1—10 x 36 Austin Western jaw crusher
1—Howell impact crusher
1—4' x 8' Model BG double deck Simplicity screen
1—4' x 8' Model BG triple deck Simplicity screen
1—4' dia. x 8' Trommel scrubber
4—23 c.y. Bins with gates
1—6' x 30' McLanahan-Stone double log washer
1—Model 25 Northwest dragline Serial #11890 G.M. power

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By company operating numerous plants within 25 mile radius of Rochester, N.Y. Fully qualified and experienced—assume complete responsibility for one or more plants as to operation, maintenance, mixes, etc. Man selected will function as assistant to executive handling entire operation. Year round employment. This is an opportunity with a future.

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1—Joy RP-600 portable Compressor, mounted on 4 pneumatic wheels & powered with GM diesel
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LIQUIDATION COMPLETE CEMENT PLANT, AKRON, N.Y.

including

2—Allis Chalmers 8' x 100' Rotary Kiln.
1—Raymond 36" Bowl Mill, 50 HP.
1—Vulcan 6' x 50' Dryer, 25 HP.
1—Clyde #3 Hydrator with motor.
1—Raymond 16' Double Whizzer Separator, 75 HP.
14—Bucket Elevators, chain mounted, steel casing, 25' to 56' c.c.
1200'—9" and 14" Screw Conveyor.
15—Bins from 6' x 7', 6" x 12' to 17' x 20' x 12'.
1—Steel Building, 60' x 80' x 40' high.

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STEEL PLATE
3000 tons ¼" to ⅝" suitable for Bins, Hoppers & Chutes.

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1—Traylor 11' x 155' Rotary Kiln, ⅞" shell.
1—Allis Chalmers 9' x 130' Rotary Kiln, ¾" shell.
1—Vulcan 8' x 87', ½" shell.
2—Vulcan 7' x 80', ½" shell.
2—Link Belt Roto Louvre Dryers, 6'4" x 24'.
1—Rennenberg 6' x 50', ⅜" shell.
1—Ruggles Cole 5' x 30', ⅜" shell.
1—Allis Chalmers 4' x 40'.
1—Allis Chalmers 4' x 30', ⅜" shell.
1—34" x 30', 5/16" shell.

MILLS—CRUSHERS—PULVERIZERS

2—Traylor Compeb Mills 7' x 27' with 1—500 HP & 1—600 HP motor 3/60/440.
1—Hardinge 4½" x 24" Steel Conical Mill.
1—Denver 3' x 5' Continuous Ball Mill.
1—Telsmith Red. Crusher no. 46, 50 HP.
2—Kennedy #6 Gyratory Crushers, 50 HP.
5—Jaw Crushers 12" x 18" to 36" x 48".
1—Penn. Non-Clog Swing Hammermill, size 5060, Hopper opening 47" x 60", cap., 200-275 tons per hour, UNUSED.
1—Penn. Super-Thor Hammermill, size SXT-13, 250 HP.
3—Raymond 5 Roll Low Side Mills.

AIR SEPARATORS—SCREENS

1—18' dia. Raymond Double Whizzer Separator with 100 HP motor.
1—14' dia. Raymond Double Whizzer Separator with 60 HP motor.
1—Gayco 5' dia. mechanical Air Separator.
1—Raymond 30" dia. Whizzer Separator.
1—Tyler Hummer Screen 4' x 10' type 38 with V-52 Vibrators and Thermionic unit.

CONVEYORS

1—Fuller-Kinyon Conveying System, type H257, 100 HP.
2—Fuller-Kinyon Conveying Systems type 10-B-No. R, 75 HP.

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Tel.: Market 3-7420

FOR SALE

One used 125 horsepower, 440 volt mine hoist motor, complete with control panel, grid resistors and master switch. Complete details on request. All equipment in good operating condition.

Gouverneur Talc Co., Inc.
Gouverneur, New York

KILNS-DRYERS

10' x 11' x 175' Vulcan Kiln, ¾" shell
8'8" x 70' Hardinge Dryers, ⅝" shell
11' x 175' Traylor Kiln, ¾" shell
10' x 78' Dryer, ¾" shell
8' x 115' United Kiln, ½" shell
7'8" x 100' Kiln, ½" shell
7'6" x 60' Dryer, ½" welded shell
7' x 50' Allis Dryer, ⅝" shell
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1—Kennedy 7' x 9' continuous ball mill, integral herringbone gear. 150 HP. 1948. LIKE NEW!

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BALL, Kennedy 7' x 9', 150 HP
ROD, Marcy 8' x 12', 350 HP
ROD, Kennedy 4' x 8', 50 HP, EPD
ROD, Marcy 7' x 15', 4" Liners, 300 HP
CONICAL, Hardinge 8' x 36"
CONICAL, Hardinge 4' x 16"
BALL-TUBE, Allis-Ch. 6' x 16'
BALL, Kennedy 4' x 8', 50 HP, EPD

SPECIAL

1—Vulcan 10' x 11' x 175' rotary kiln, ¾" shell, 2-tire

CRUSHERS-PULVERIZERS

GYRATORY, Allis #322, 3", 30 HP
GYRATORY, Kennedy #49S, 12", 100 HP
JAW, 18" x 9", 20" x 6', 36" x 15"
ROLLER, Raymond, 66", 6-roll, 200 HP
PULV., B & W Type E-32, 75 HP
SAWTOOTH, Robinson #13, 36", 15 HP
DBL. ROLL, Allis 30" x 14", 25 HP

SPECIAL

Kennedy #49S gyratory crusher, 100 HP, 12" feed.

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2 Loomis Well Drills—Electric
2 Loomis Well Drills—Gasoline
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1 Telsmith Settling Tank, #5
1 Telsmith Settling Tank, #6
1 Telsmith Settling Tank, #7
1 Western Side Dump Car, 16 Yd., Std. Ga.
1 Orton Steam Crane, 25 Ton, 2½ Yd.
1 Vulcan Steam Locomotive—38 Ton
1 Vulcan Steam Locomotive—40 Ton
1 Baldwin Steam Locomotive, 50 Ton & Parts
1 Buffalo Exhaust Fan, #24
1 Buffalo Exhaust Fan, #30
1 Gates Gyratory Crusher, #7½K
1 McLanahan Crusher, 30" x 42" style C627
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1 Main Shaft and Mantle Assembly
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2 5 HP, Allis-Chalmers, SR, 3/60/440/600
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1 50 HP, Economy Westinghouse, 3/60/440/900
1 150 HP, AC, SC, 3/60/440/1200
1 100 HP, Burk, 3/25/440/1500
1 9 HP, G.E., Direct Current, 230V, 900 RPM

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1 1000 Amp, 250V, Allis-Chalmers Generator Direct Connected to 300 HP AC Synchronous Motor 3/60/440/600

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52-IT Vermeer ditcher	D-311 Cat. eng. power unit	Cable controlled D7 angle dozer
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25-ton Industrial Brownhoist with D13000 Cat. diesel & 60 ft. boom

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7—25 ton, 4—45 ton, 1—65 ton, 1—80 ton, 2—100 ton General Electric
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300—1½, 3, 5, 16 & 20 yds. cap.

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96' boom, 40' mast, 50' S. legs, 39'10" sills, 16' bull wheel

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4' x 5' Miners Foundry
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7' x 15' Marcy Open End 300 HP motor

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36" x 24" Jeffrey Type B-2, new 1954
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3XE Gruendler 30" x 48"
SXT-14 Pennsylvania 400 TPH

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2" x 6" Sturtevant Lab. with motor & stand
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No. 19 Kennedy Van Saun
No. 122 Allis Chalmers Hydrocone
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16" Allis Chalmers Superior McCully
20" Allis Chalmers Superior McCully (2) new 1948
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No. 11 McCully

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Size 12 Stephen Adamson 10 HP 3/60/220/440

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5'6" x 60' Dryer or Cooler
3—10' x 78'—¾" shell

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Floating equipment of all types to our or your specifications.
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DRYERS: 4x20, 5x28, 6x25, 6½x50, 8x70, 10x78.
COMPRESSORS: 750 CFM West. staty. 600 CFM IR Gyrofio. 10 Joy 75 CFM, 2400 CFM PRE2.
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SEPARATOR Dings Cross-belt with electromagnet and Rectifier
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MANHEIM, W. VA.

1—Vulcan 9'x100'x⅝" Rotary Kiln
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1—Traylor 8'x11' Steel Lined Ball Mill
2—Beth. Fdy. 7'x24' Compeb Mills, three Compartment
2—Beth. Fdy. 5'x22' Tube Mills
3—Allis-Chalmers 6K; 8K Gyratorys
1—Non-clog 36"x50" Hammermill
10—Fuller Lehigh 42" Pulverizers
1—West. 750 KW Turbo Generator Set

STOCK ITEMS

5'x45' Standard Rotary Dryer
6'x25'; 6'x50' Louisville Rotary Dryers
7'x50'; 8'8"x70' Ruggles-Coles Dryers
15"x8" to 24"x18" Jeffrey Hammermills
2—Raymond 4 Roll High Side Mills
6—Tyler Hummer Screens 4'x8', 4'x6'
4—Robinson Saw Tooth Crushers
535'—24" Troughing Conveyor
Bucket Elevators 45' to 90' centers
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ROCK PROD. EQPT. DIV.
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BALL MILLS: One 5½ ft. x 22 ft., two 7 ft. x 24 ft., with or without motors. Hardinge 8' x 36" and 8' x 48" Conical Mills complete with 2200 volt motors.
KILNS: Two 8' x 124 ft.
CONVEYORS: One 36" and 42" x 736 ft., complete with all equipment and supporting structure.
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HOISTS: Lidgerwood single drum 7' dia., 5'7" face, 32,000 lbs. pull, 1⅝" rope, 250 or 450 FPM, 150 or 250 H.P. One single drum Nordberg 5' dia., 5' face, 1⅛" rope, 100 H.P., 750 FPM. One Nordberg double clutched drum 10' x 10', 1½" rope, 1250 H.P., 1200 FPM. All the above with post brakes, Lilly controls, 2200 volt motors and controls. Other hoists 100 H.P. to 2500 H.P.
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20# — 30# — 40#
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St. Louis 4, Mo.

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Box 97 Phone 580 Crosby, Minnesota

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Unit	1020	Used ¾ yd. Trench Hoe, gas power, priced under market.
Lorain	TL25	Used ¾ yd. Dragline, Cat D315, long tracks, rebuilt in our shop.
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Rex 5 Yd. Mixer, Chrysler engine, Rebuilt and perfect.
Rex 3½ Yd. Mixer, Chrysler engine; mounted on I-H 174 Tandem. A Honey.

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ROCKFORD, ILLINOIS

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The publisher of this magazine is often asked what kind of a man you are . . . and how many like you are receiving his magazine.

Why is he asked?

Because the *advertisers* (whose money is his chief income) insist upon knowing the types of people (by industry or profession, by title) for whom the magazine is edited — and how many are getting it.

In order to standardize on the presentation of such information to advertisers and to have its accuracy vouched for by a disinterested third party, nearly 450 publishers have joined some 200 leading advertisers and advertising agencies in a non-profit organization called Business Publications Audit.

The purpose of BPA is to assure advertisers . . . by frequently checking and rechecking . . . that each member publisher is indeed distributing his magazine, in the *numbers* promised, to the *types* of men he promised would receive it.

The BPA symbol in this magazine means that *you belong* . . . that because of your occupational interests you are qualified, in the eyes of the advertisers, to receive it.

The advertiser can thus tell whether he's getting his money's worth.

The publisher has a better sales story to prospective advertisers because his magazine is "audited."

And you, the reader, get more value from the magazine because both the advertisers and editors, knowing what your special occupation is and what your interests are, are better able to prepare advertising and editorial material that will be most informative and useful to you.

What you can do

Publishers and advertisers frequently write to magazine readers to learn what kind of articles and advertisements appeal most. Cooperate with them — will you? — by answering their questions . . . in the interest of better communications between makers and markets.

BUSINESS PUBLICATIONS AUDIT OF CIRCULATION, INC.

420 Lexington Avenue New York 17, N. Y.

BPA

A NON-PROFIT, TRIPARTITE MEMBERSHIP CORPORATION OF ADVERTISERS, ADVERTISING AGENCIES AND BUSINESS PUBLICATIONS

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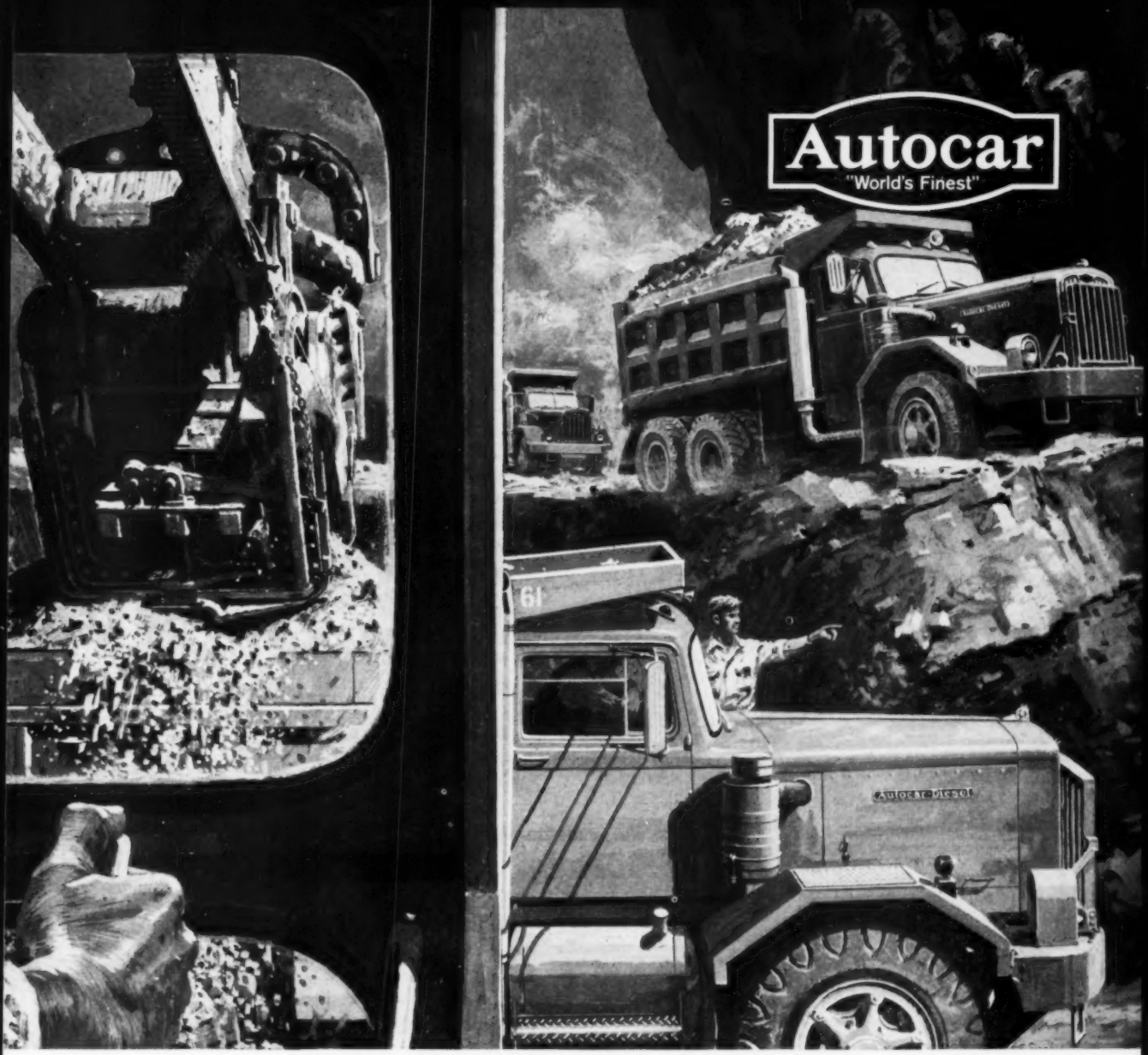

Job for Autocars—A truck is a production tool, and tools must match the job—like the Autocar ten-wheelers shown at work here.

Peak production calls for Autocar ..."nothing less"

It doesn't pay to mince words. When your shovel piles on a yard more every time—when the floor is rough, rocky or difficult—when you can't afford a slowdown in the hauling cycle—*you need an Autocar.*

And *only* Autocar *fully* custom-engineers each truck to fit the job... your assurance of top performance.

Autocar's great load capacity, power and stamina are the result of the way Autocars are built—with unequaled precision and quality.

Where the jobs are tough and schedules tight, Autocars are an absolute necessity. If you settle for less, you'll *get* less—so why try to get by without the "World's Finest"?

Autocar service is prompt and comprehensive at all White-Autocar outlets . . . in every major city.

Autocar
"World's Finest"

Division of
The White Motor Company
Exton, Pa.

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USS Tiger Brand hoist ropes

last over 1800 hours

on 25-yard dragline

This big dragline works around the clock—three shifts a day—at the Harmattan Mine of Fairview Collieries Corporation, Danville, Illinois. The twin hoist ropes hardly have a chance to cool off but they last over 1800 hours in this rugged service.

The USS Tiger Brand hoist ropes are two inches in diameter and 450 feet long. They are made of tough Monitor steel which has a reputation for long service on jobs like this.

The upper boom supports are also Tiger Brand—six two-inch diameter galvanized boom support strands 118 feet long. These are noted for their strength and resistance to vibration fatigue. Most of the largest shovels in the country are equipped with USS Tiger Brand Boom Support assemblies because of their reputation for safety and long service.

Why USS Tiger Brand is your best buy.

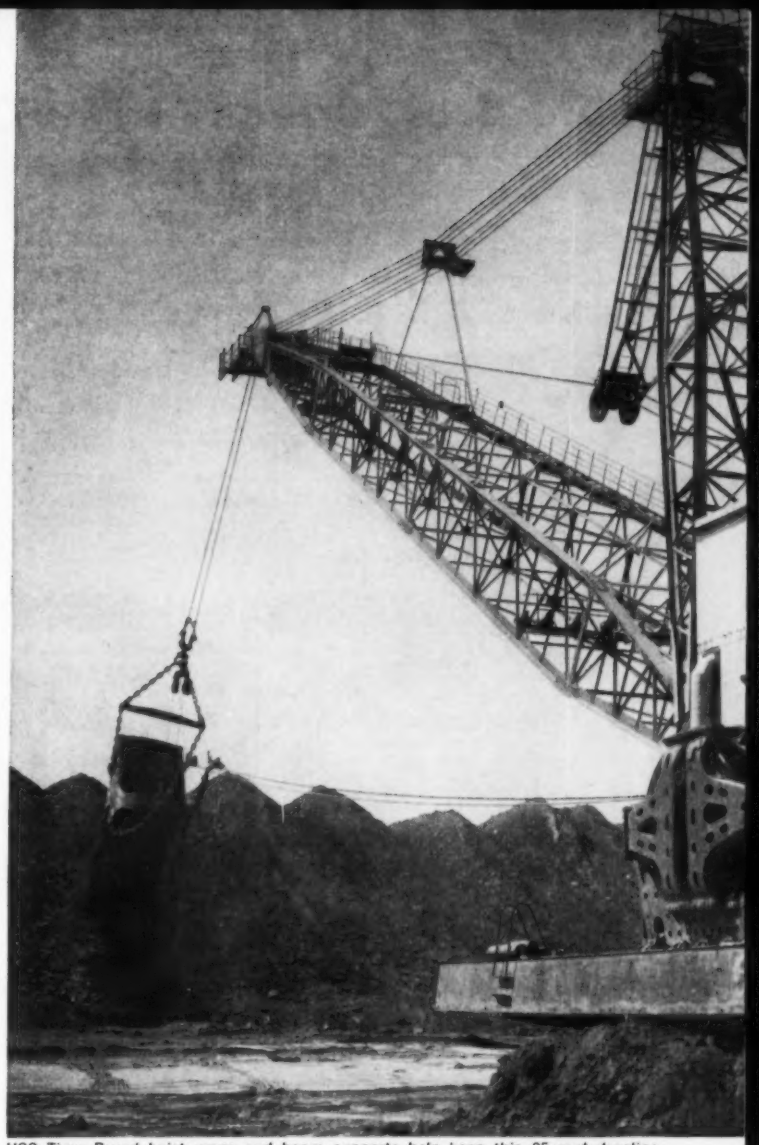
Tiger Brand Wire Rope is designed by one of the industry's most capable staffs of wire rope engineers. It is made by a company that maintains the most complete research and manufacturing facilities in the steel industry. When you buy Tiger Brand you get the right rope for the job. And your installation is no further away than a phone call from experienced American Steel & Wire field service representatives.

You can get Tiger Brand Wire Ropes for any type of mining service. For information write American Steel & Wire, Dept. 0111, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

American Steel & Wire Division of United States Steel

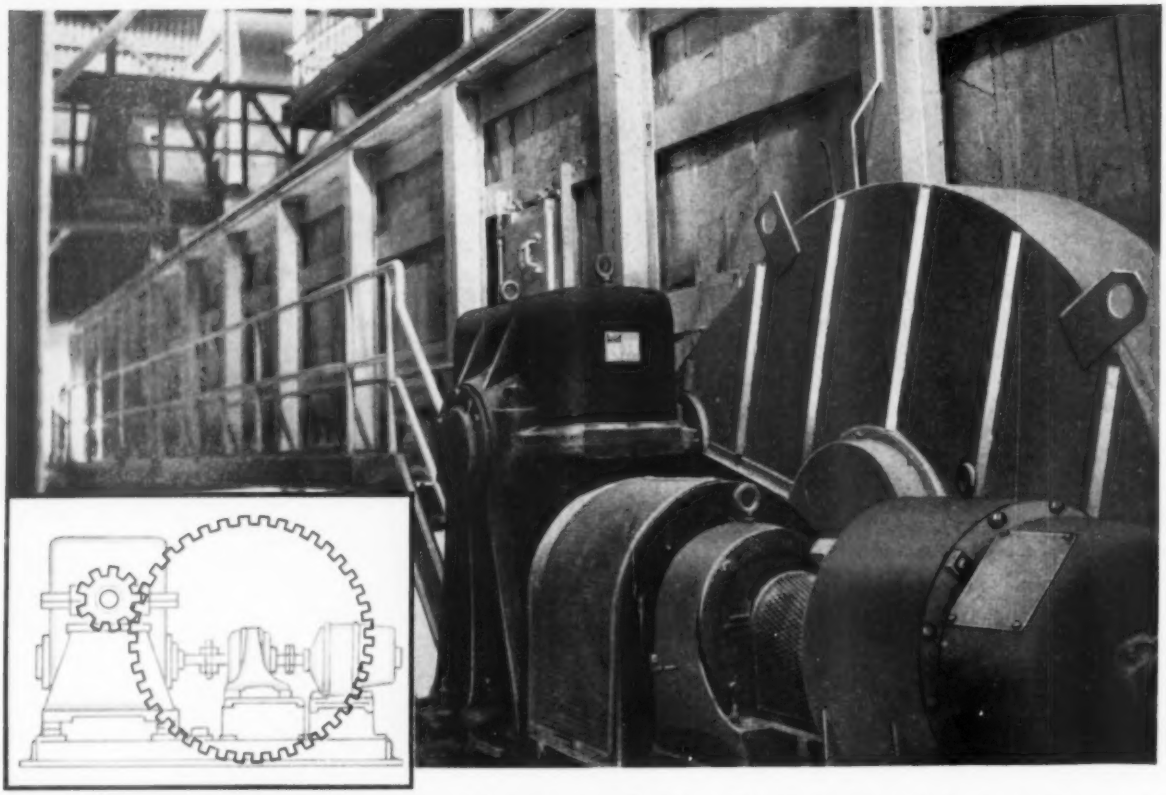
Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron, Fairfield, Alabama
United States Steel Export Company



USS Tiger Brand hoist ropes and boom supports help keep this 25-yard dragline on the job around the clock.

Double drum shows 2-in. Tiger Brand hoist ropes designed for strength and flexibility.

Foote Bros. Drives In The Cement Industry



Team of Reducers GIVES PERFORMANCE PLUS Driving Marquette Cement's ACL Grate

Two Foote Bros. Reducers team up to provide a powerful, close-coupled drive for the ACL Chain Grate used in Marquette Cement Company's ultra-modern Milwaukee plant.

Dependable power—and plenty of it—was required to drive the head shaft of the 82 ft. long x 12½ ft. wide furnace grate which moves pelletized raw material through the drying and preburning chambers.

Problem: In a limited space, provide a right angle drive capable of delivering a final torque of 1,400,000 in. lbs. at the head shaft of the grate.

Solution: To provide the necessary reduction from a 20 HP variable speed motor, a Foote Bros. 224 SL concentric shaft Reducer was coupled to an 18 S Right Angle Worm Gear Reducer which drives a large spur gear set to turn the grate.

The smooth, steady, and positive grate travel provided by the team of Foote Bros. Reducers, is an important requirement of the carefully balanced Marquette process. Since going into service almost two years ago, the Drives have met every requirement of Marquette's design and production engineers for "no downtime" performance.

There's a Foote Bros. Drive made to meet your power transmission requirements. Ask your nearby Foote Bros. Authorized Distributor for information or assistance concerning your power transmission problems. He's ready to help you.

FOOTE BROS. GEAR AND MACHINE CORPORATION

4571 South Western Boulevard, Chicago 9, Illinois

POWER TRANSMISSION DRIVES

Enter Cover 3 on card, page 169 →

For Simple Applications . . . Special Problems,

CHOOSE WEMCO®...

Pacific Building Materials did !

Howard Hamlin, Plant Superintendent at Pacific Building Materials Division of Glacier Sand and Gravel Company, Portland, says:

"Our five WEMCO Sand Prep Machines, with their low maintenance and lack of mechanical trouble, play an important part in the over-all efficiency of our Curry Street Plant. Repairs and maintenance on the five machines we have here, plus three at other locations, have totaled less than $100 per year average during their eight years of operation. Per machine, this amounts to less than $12 per year."

The Curry Street Plant of Pacific Building Materials is designed to furnish all sizes and blends of sand required in the Portland area. Treating the varying gradation of sand dredged from the Willamette River requires the utmost in flexibility and efficiency. Only the WEMCO Sand-Prep combines all of these requirements. Part of these outstanding characteristics are: slow spiral speed . . . multiple pitch spirals . . . large and quiescent pool . . . and over-all sturdy design and construction . . . plus L/D*, of course.

Whatever your sand-sizing problems, WEMCO equipment will produce a better end result at lower cost. Why not follow Mr. Hamlin's recommendation and find out more about these products? Your nearest WEMCO representative is fully qualified to give you complete information and assistance in all your aggregate treating problems.

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a division of
Western Machinery Company
650 Fifth Street, San Francisco 7, California
Distributors throughout the world

THE WEMCO LINE OF QUALITY MACHINES FOR PROFITABLE AGGREGATE PROCESSING

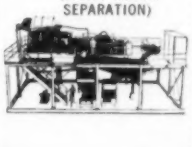
*SAND-PREP WITH EXCLUSIVE LIFTING DEVICE

SAND-SORT

SAND-CLONE

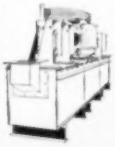
ROCK & SAND JIGS

MOBIL-MILL (HEAVY MEDIA SEPARATION)



SAND-SIZER

SAND-SCRUBBER



PUMPS

If you keep your EYE on the profit picture! . . .

...YOU'LL CHOOSE AN EIMCO!

Before you decide to invest in any crawler tractor answer this one important question:

HAVE YOU SEEN AN EIMCO IN ACTION?

If your answer is no, you owe it to yourself and to your company to compare the modern Eimco tractor unit with any other make of comparable, or even greater size. If your answer is yes, chances are you've already ordered an Eimco!

Compare how the Eimco 103 . . . the Eimco 105 . . . or the Eimco 106 lines of tractor units will outpull, outpush, outmaneuver, outperform and outlast any other crawler tractor in their fields . . . and with greater flexibility in use.

The reasons lie in Eimco's unique combination of important exclusive features, including "Unidrive" transmission, single stage Torque Converter, Dual Final Drives, up-front operator position, patented Unit Construction and dozens of others, too numerous to list here.

To up your profits and productivity, let one of Eimco's qualified sales engineers explain all the multiple advantages of the Eimco line of modern tractors. Just contact the sales office nearest you, or write to The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah.

EIMCO . . .
the modern line of Tractors!

103	105	106
100 H.P.	143 H.P.	205 H.P.

- Excavators
- Tractors - Dozers
- Front End Loaders
- Log Loaders
- Special Steel Mill Excavators and F.E.L.'s

For details and specifications on any of the Eimco units write Dept. G-1, The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah, U.S.A.

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